DRAFT
ENVIRONMENTAL ASSESSMENT
FOR
FORT JACKSON ENERGY RESILIENCE PROJECT
AT FORT JACKSON ARMY BASE, SOUTH CAROLINA

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

ACM	Asbestos-Containing Materials
ACP	Access Control Points
AFFF	Aqueous Film Forming Foam
AIRFA	American Indian Religious Freedom Act
AOC	Area of Concern
AQCR	Air Quality Control Regions
AR	Army Regulation
BACT	Best Available Control Technology
BMP	Best Management Practice
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CDC	Child Development Center
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
$CO2_e$	Carbon Dioxide Equivalents
COA	Course of Action
COC	Community of Comparison
COR	Contracting Officer's Representative
CWA	Clean Water Act
dBA	A-Weighted Sound Level
DERP	Defense Environmental Restoration Program
DESC	Dominion Energy of South Carolina
DNL	Day-Night Level
DoD	Department of Defense
DPW	Directorate of Public Works
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ESMC	Endangered Species Management Components
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
FUDS	Formerly Used Defense Sites
GHG	Greenhouse Gas
GIS	Geographic Information System
HABS/HAER	Historic American Building Survey/Historic American Engineering Record
HDD	Horizontal Directional Drilling
HFPO-DA	Hexafluoropropylene Oxide Dimer Acid
ICRMP	Integrated Cultural Resources Management Plan
ICUZ	Installation Compatible Use Zone

INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
LBP	Lead-Based Paint
LUC	Land Use Controls
MC	Munitions Constituent
MEC	Munitions and Explosives of Concern
mg/m^3	Milligrams Per Cubic Meter
MMRP	Military Munitions Response Program
MS4	Municipal Separate Storm Sewer System
MTC	McCrady Training Center
MW	Megawatt
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NO_x	Nitrogen Oxides
NRHP	National Register of Historic Places
O_3	Ozone
OEI	Office of Energy Initiatives
ONMP	Operational Noise Management Plan
ORAP	Operational Range Assessment Program
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
Pb	Lead
PCB	Polychlorinated Biphenyl
%	Percent
PFAS	Polyfluoroalkyl Substances
PFBS	Perfluorobutane Sulfonic Acid
PFHxS	Perfluorohexane Sulfonic Acid
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PM_{10}	Particulate Matter Less Than or Equal to 10 Micrometers
$PM_{2.5}$	Particulate Matter Less Than or Equal to 2.5 Micrometers
ppb	Parts Per Billion
PPE	Personal Protective Equipment
ppm	Parts Per Million
PSD	Prevention of Significant Deterioration
PSUS	Palmetto State Utility Service
PV	Photovoltaic
RCRA	Resource Conservation and Recovery Act
RCW	Red-Cockaded Woodpecker

REC	Record of Environmental Consideration
ROI	Region of Interest
RPC	Request for Proposed Change
RPMP	Real Property Master Plan
SCAPCR	South Carolina Air Pollution Control Regulations
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SCIAA	South Carolina Institute of Archaeology and Anthropology
§	Section
SHPO	State Historic Preservation Office
SO_2	Sulfur Dioxide
SWMU	Solid Waste Management Unit
TBD	To Be Determined
TDC	Teamwork Development Course
THPO	Tribal Historic Preservation Office
tpy	Tons Per Year
TRADOC	Training and Doctrine Command
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine
USAPHC	United States Army Public Health Center
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
$\mu g/m^3$	Micrograms Per Cubic Meter

1.0 INTRODUCTION

1.1 ENVIRONMENTAL ANALYSIS PROCEDURE

This Environmental Assessment (EA) addresses the Proposed Action to construct energy resilience measures at Fort Jackson, South Carolina. The Proposed Action would support Fort Jackson's energy resilience project through development of two Natural Gas Generator Units with associated supply piping, a Solar Photovoltaic (PV) System Array, and a microgrid to serve Fort Jackson. The development would serve as a grid-facing asset, providing contingency support to the installation. Fort Jackson would act as the central management agency, with the Army Office of Energy Initiatives (OEI) supporting the project as the direct liaison authority for installation energy resilience projects. This effort uses private sector financing to achieve its goals.

The National Environmental Policy Act (NEPA) process encompasses environmental review of any major federal action being proposed for undertaking. The proposed activities constitute a federal action, and therefore must be assessed following NEPA. The Council on Environmental Quality (CEQ) was established under NEPA, Title 42 United States Code (U.S.C.) 4321, et seq., to implement and oversee federal policy in this process. In 1978, the CEQ issued regulations for implementing the NEPA process under CEQ's *National Environmental Policy Act Implementing Regulations* (Title 40 Code of Federal Regulations [CFR] Parts 1500–1508). The January 9, 2023, version of CEQ regulations is being used, *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change* (40 CFR Parts 1500–1508) and the Department of the Army's 32 CFR Part 651, *Environmental Analysis of Army Actions* (Army Regulation [AR] 200-2). The January 9, 2023, version of CEQ regulations provides interim guidance on analysis of greenhouse gas (GHG) and climate change effects of their proposed actions under NEPA. AR 200-2 details the Army's policies and responsibilities for the early integration of environmental considerations into planning and decision-making and requires environmental analysis of Army actions affecting human health and the environment. AR 200-2 serves to supplement NEPA regulations under 40 CFR Parts 1500–1508.

The CEQ regulations require that the federal agency considering an action evaluate or assess the potential consequences of the action or alternatives to the action, which may result in the need for an EA or Environmental Impact Statement (EIS). Under 40 CFR Parts 1500–1508:

- An EA must briefly provide sufficient evidence and analysis to determine whether a Finding of No Significant Impact (FONSI) or an EIS should be prepared.
- An EA must facilitate the preparation of an EIS if required.

If the execution of any of the Proposed Actions involve action in a floodplain under Executive Order (EO) 11988, *Floodplain Management*, a Finding of No Practicable Alternative (FONPA) would be prepared. Proposed Actions that could affect wetland areas would also require a FONPA under EO 11990, *Protection of Wetlands*.

1.2 PROJECT LOCATION AND BACKGROUND

Fort Jackson is an active Army base located in Columbia, South Carolina (**Figures 1-1** and **1-2**). The base encompasses 52,316 acres with more than 1,160 buildings and over 100 ranges and

field training sites. Fort Jackson is home to the Army's main production center for Basic Combat Training and is operated by the United States Army Training and Doctrine Command (TRADOC).

Fort Jackson is the largest and most active Initial Entry Training center in the Army, training 50 percent (%) of all Soldiers entering the Army each year. The installation is home to two brigades, nine battalions, and 54 companies, including the 165th Infantry Brigade, the 193rd Infantry Brigade, the 282nd Army Band, and the Army Reserve 81st Readiness Division. Other institutes at Fort Jackson include the Army Drill Sergeant Academy, the Army Institute for Religious Leadership, the Army Soldier Support Institute, and the National Center for Credibility Assessment.

The Energy Policy Act of 2005 [EPAct; 42 U.S.C. Section (§) 13201 *et seq.*] mandated federal facilities use at least 7.5 % renewable energy beginning in 2013. On December 8, 2021, the White House released a new EO 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* – which includes requirements for federal agencies to achieve a carbon pollution-free electricity sector by 2035 and net-zero emissions economy-wide by no later than 2050. In Fiscal Year 2020, the Secretary of the Army signed Army Directives 2020-03 and 2020-08, which are intended to update energy and water resilience requirements for Army installations as well as address climate change impacts on the enterprise.

Fort Jackson has identified four potential Course of Action (COA) properties for the proposed developments. COAs 1 and 2 are considered for development of the solar PV system, battery energy storage system, and a microgrid. COA 1 would require relocation of existing training elements to one of two parcels north of the cantonment area. COAs 3 and 4 are considered for siting the Natural Gas Generator Units. A natural gas pipeline would be installed on installation property and connected to an existing supply line to provide natural gas for the generator units. The land from the four COAs would be out granted with a lease to the project developer and service utility, Dominion Energy of South Carolina (DESC), for a 30-year term under the authority of 10 U.S.C. 2667. The following sections include a detailed description of the proposed missions.

1.2.1 Solar PV System

The Army Installation Energy and Water Strategic Plan provides guidance to installations regarding secure and sustainable utility and infrastructure operations in order to improve the Army's ability to sustain installation energy and water for critical missions (Army, 2020). The Army will lease one parcel to DESC for a solar PV system in adherence with this guidance. The sites under lease consideration are known as Fit to Win (COA 1) and Chesnut/Semmes/Ivy (COA 2).

During normal operation, the grid-facing assets would generate power for public ratepayers including Fort Jackson. During contingency operations, the assets would support 100% of critical loads for a minimum of 14 days. Power during contingency operations would be purchased at the standard rate of delivery at the installation.

1.2.2 Natural Gas Generator Units

The Army will lease one parcel for a 25-megawatt (MW) capacity Natural Gas Generator System to meet Army Installation Energy and Water Strategic Plan guidance (Army, 2020). The sites under lease consideration are known as Hill Street Substation (COA 3) and Moseby Street Substation (COA 4). The Natural Gas Generator System would serve as the primary generating

asset to meet the 14-day critical load requirement. A natural gas pipeline would be constructed to the selected COA and connected to an existing pipeline currently servicing Fort Jackson.

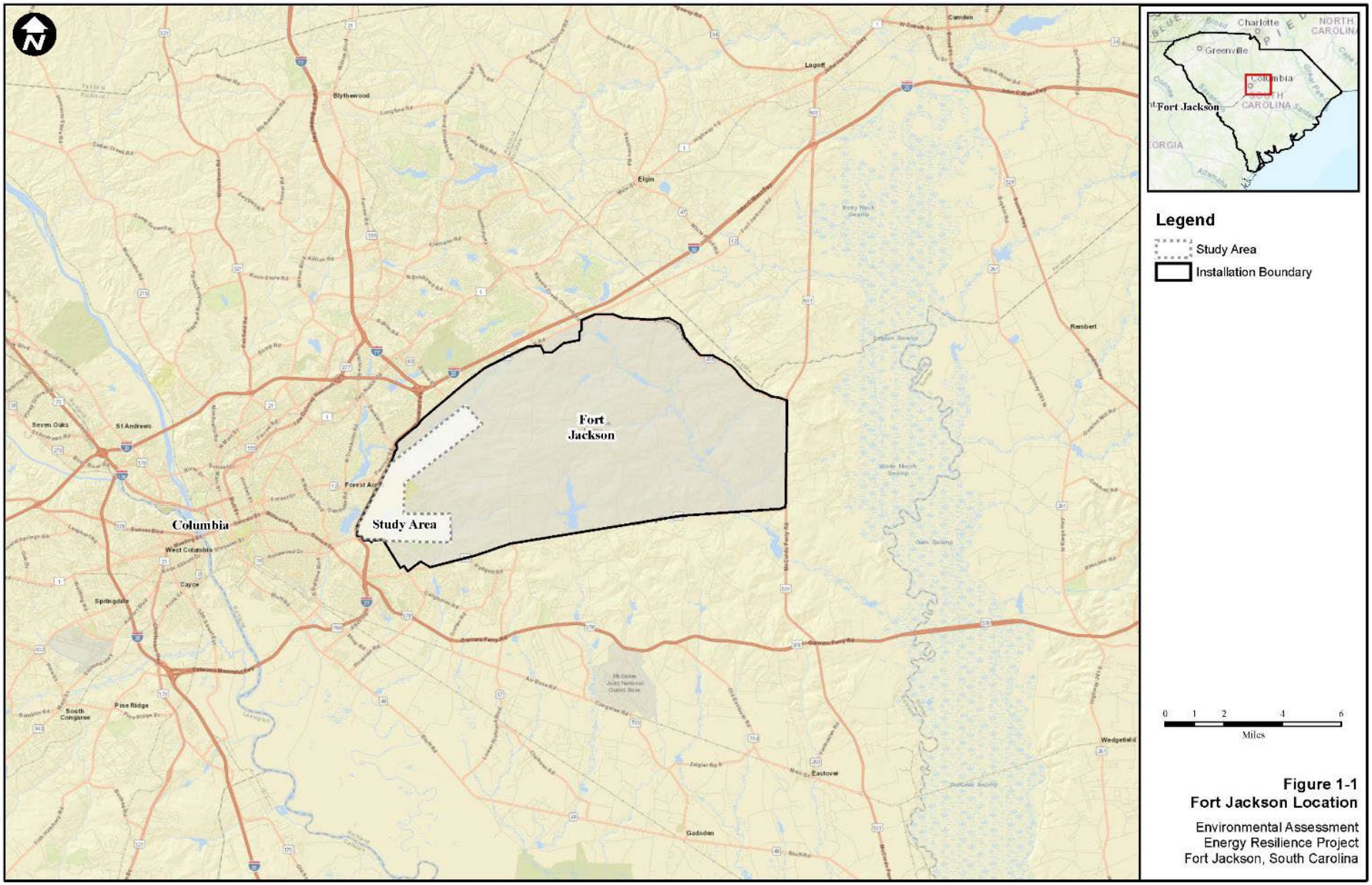

Figure 1-1
Fort Jackson Location

Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

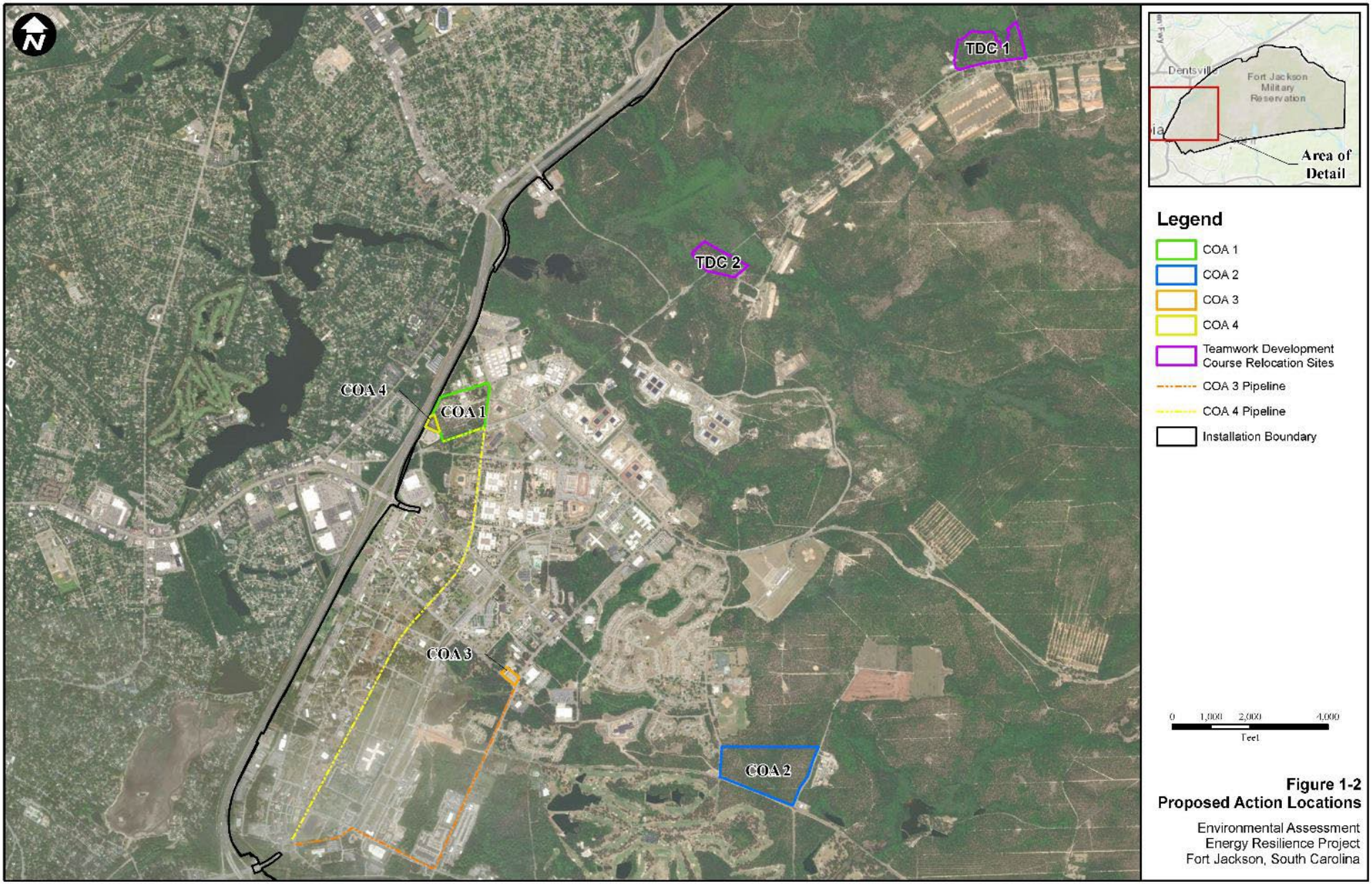

Figure 1-2
Proposed Action Locations

Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

1.3 PURPOSE AND NEED FOR THE ACTION

The purpose of the Proposed Action is to install a 25 MW capacity Natural Gas Generator System, solar PV system, battery energy storage system, and a microgrid. The Proposed Action would increase energy resiliency, efficiency, and affordability by developing and improving energy infrastructure assets.

The Proposed Action is needed to enhance the energy resilience of the Army. The energy resilience project would enhance the installation's ability to avoid, prepare for, minimize, adapt to, and recover from anticipated and unanticipated energy disruptions, and to ensure mission readiness through secure and resilient access to energy. A resilient installation would support a seamless Army mission by having the energy, water resources, and supplies to support critical missions, and the ability to withstand, attack, and recover from interruption. The Proposed Action would serve Fort Jackson as a critical grid-facing asset, particularly during contingencies or emergency situations, thereby supporting the installation's energy resilience project.

In accordance with Army Directive 2020-03, "Installation Energy and Water Resilience Policy", Army installations are required to secure critical missions by being able to provide a minimum of a 14-day supply of necessary energy to support critical loads. Installations must also sustain all installation missions by 1) assuring access to resource supplies, 2) improving infrastructure conditions, and 3) promoting robust system operations. Currently, Fort Jackson cannot sustain all its training missions and associated critical facilities for the 14-day minimum 100% critical load requirement to meet the directive (Army, 2020).

The goal of the Fort Jackson Energy Resilience is to improve the Army's ability to sustain installation energy and water to critical missions to improve the energy infrastructure's resiliency, efficiency, and affordability. The Proposed Action would increase efficiency by reducing overall reliance on fossil fuel energy use, maximizing efficiency, implementing energy recovery and cogeneration opportunities, and striving to offset demand with on-site energy generation. Affordability would be achieved through decreasing electricity costs and increasing the use of third-party financing through performance contracting and private capital investment in energy projects.

1.4 DECISION TO BE MADE

This EA evaluates the potential environmental consequences of implementing the Proposed Action compared to the No Action Alternative as described in **Section 2.1**. The Army must make a decision regarding the selection of alternatives to support the Fort Jackson energy resilience project developments.

Based on the analyses conducted in support of this EA, the Army would make one of four decisions regarding the Proposed Action:

1. Choose the alternative action that best meets the purpose of and need for this project and sign a FONSI allowing implementation of the selected alternative;
2. Choose the alternative action that best meets the purpose of and need for this project and sign a FONPA allowing implementation of the selected alternative;

3. Initiate preparation of an EIS if it is determined that significant impacts would occur as a result of implementation of the action alternatives; or
4. Defer a decision and not pick any of the alternatives, in which case a FONSI/FONPA would not be signed.

1.5 PUBLIC AND AGENCY COORDINATION/CONSULTATION

1.5.1 Interagency and Intergovernmental Coordination and Consultations

To comply with coordination and consultation requirements under NEPA, agencies must make environmental information available to the public during the decision-making process and prior to taking action. The premise of NEPA is that the quality of federal decisions will be enhanced if proponents provide information on their actions to state and local governments and the public and involve them in the planning process. The Intergovernmental Coordination Act and EO 12372, Intergovernmental Review of Federal Programs, require federal agencies to cooperate with and consider state and local views in implementing a federal proposal.

1.5.2 Public and Agency Review of Draft EA

Fort Jackson will publish a Notice of Availability (NOA) for the Draft EA and FONSI/FONPA in *The State* in Columbia, South Carolina to start a 30-day public review period. At the same time, Fort Jackson will distribute copies of the Draft EA and FONSI/FONPA will be distributed to federal, state, and local agencies and applicable Federally recognized Native American Tribes. Government to government consultation will be conducted with Federally recognized Native American Tribes. During the public review period, Fort Jackson will provide copies to individuals or organizations upon request. At the closing of the public review period, Fort Jackson will incorporate applicable comments from the general public and interagency and intergovernmental coordination and consultation into the analysis of potential environmental impacts performed as part of the EA. These comments will be included in the Final EA and **Appendix A**, where applicable.

1.5.3 Section 106 Consultations

The National Historic Preservation Act (NHPA), 54 U.S.C. § 306108 and its implementing regulations at 36 CFR Part 800 require an agency to consult with federally recognized tribes who may have properties of cultural and religious significance affected by the project. To comply with legal mandates, federally recognized tribes that are affiliated historically with the Fort Jackson geographic region will be invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. The tribal coordination process is distinct from NEPA consultation or the Interagency/Intergovernmental Coordination for environmental planning processes and requires separate notification of all relevant tribes. The timelines for tribal consultation are also distinct from those of intergovernmental consultations. The Fort Jackson point-of-contact for consultation with Tribal Historic Preservation Offices (THPOs) and the Advisory Council on Historic Preservation is the Cultural Resources Manager.

The Native American tribal governments that will be consulted with regarding this action are listed below.

- Absentee Shawnee Tribe
- Alabama-Quassarte Tribal Town
- Catawba Indian Nation
- Cherokee Nation
- Chickasaw Nation
- Eastern Band of Cherokee Indians
- Eastern Shawnee Tribe of Oklahoma
- Kialegee Tribal Town
- Muscogee (Creek) Nation of Oklahoma
- Poarch Creek Indians
- Shawnee Tribe
- Thlopthlocco Tribal Town
- Tuscarora Nation
- United Keetoowah Band of Cherokee Indians

1.5.4 Other Agency Consultations

As part of this EA and per the requirements of Section 7 of the Endangered Species Act and implementing regulations, Fort Jackson will transmit findings of effect and request for concurrences to the United States Fish and Wildlife Service (USFWS). Similarly, a finding of effect and request for concurrences will be transmitted to the South Carolina State Historic Preservation Office (SHPO) pursuant to Section 106 of the NHPA.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed action and alternatives are described in this section. In addition, CEQ's National Environmental Policy Act Implementing Regulations (Title 40 CFR Parts 1500–1508) specify that an EA must include a No-Action Alternative. The No-Action Alternative provides the baseline against which the environmental impacts of implementing the alternatives can be compared.

The NEPA and the CEQ regulations mandate the consideration of reasonable action alternatives to accomplish the Proposed Action. "Reasonable alternatives" are those that meet the purpose of and need for the Proposed Action and can be implemented. Per the requirements of 32 CFR Part 651, the Army environmental analysis regulations, selection standards are used to help determine feasibility of each action alternative, including potential facilities requirements and the extent to which each action alternative would fulfill the purpose and need for the Proposed Action. This section outlines the selection standards that were used by the Army to develop and analyze these alternatives.

2.1 PROPOSED ACTIONS

Fort Jackson has identified four land parcels for the purposes of siting the Natural Gas Generator Units, solar PV system, battery energy storage system, and a microgrid. The land would be out granted with a lease to the project developer and service utility DESC for a 30-year term.

The four considered sites include Fit to Win (COA 1) and Chesnut/Semmes/Ivy (COA 2) for the solar PV system, and Hill Street Substation (COA 3) and Moseby Street Substation (COA 4) for the Natural Gas Generator Units. The Proposed Actions are described in detail in the following sections.

2.1.1 Description of Proposed Action for Solar PV System

Two primary parcels have been identified for the siting of the solar PV system. The parcels and their development requirements are described in detail below.

Final design for the facility has not been completed. It is anticipated that the solar PV facility would be comprised of solar PV panels mounted on steel or aluminum supporting structures. The panels would be connected to underground or above ground transmission equipment, inverters, switches, and/or transformers (if needed). Additional infrastructure required for the solar PV facility may include access roads, parking areas, and potentially a maintenance building. The solar panels would be ground-mounted and fixed, manually adjustable, or mounted with a tracking system to optimize the solar PV panel alignment, depending upon the final design. The facility would be designed and constructed in a manner compatible with government uses on adjacent land.

2.1.1.1 Fit to Win (COA 1)

COA 1 is a 33.1-acre parcel bounded by Huger Avenue to the north, Forrest Drive to the south, Jackson Boulevard to the east, and Nichols Street to the west (**Figure 2-1**). COA 1 has been identified by Fort Jackson and DESC as the ideal location for the solar PV system. Demolition of the existing Teamwork Development Course (TDC) and Fit to Win 2 Course and relocation to a new area would be needed.

Figure 2-1
Fit to Win (COA 1)

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Typical demolition activities would include removal of facility/obstacle waste, removal of hazardous waste if applicable, and utilization of heavy machinery for structure teardown. Grading and trenching activities would be required.

If COA 1 is selected, Fort Jackson would require DESC to relocate the existing training courses and facilities to a new location, as determined by the Army. Demolition is not necessary, but relocation would be a consideration based on conversations between Fort Jackson and DESC. Two sites have been selected to potentially relocate the training site:

- **TDC-1:** TDC-1 is a 29-acre semi-forested parcel located north of Dixie Road between Ranges 9 and 10 (**Figure 2-2**). The site would be suitable for development of the training course with little site modifications; however, tree clearing would be needed. TDC-1 is approximately 2.8 miles from existing TDCs.
- **TDC-2:** TDC-2 is a 15-acre forested parcel located on the north and south sides of Dixie Road and west of Ranges 1 and 2 (**Figure 2-2**). The parcel is located approximately 1.3 miles from the existing TDCs, which would require personnel to be bussed to the location for training operations. This site would require fewer trees to be removed in comparison to TDC-1.

2.1.1.2 Chesnut/Semmes/Ivy (COA 2)

COA 2 is a 60.3-acre property northwest of the intersection of Ivy Road and Semmes Road (**Figure 2-3**). The Property includes approximately 53 acres that were previously used for small arms ranges and live grenade training. Munitions and Explosives of Concern (MECs) in the Areas of Concern (AOCs) D, E, and F are Military Munitions Response Program (MMRP) sites with approved land use controls. No MECs and only limited munitions constituents are anticipated at AOCs D, E, and F. This site may require a contractor to take additional unexploded ordnance (UXO) safety measures (i.e., having explosive safety personnel on site during excavation, etc.).

There are no structures on the property but clearing of trees would be required. Additionally, a historical resources site is located within COA 2 which is eligible for the National Register of Historic Places (NRHP). Development of this site would be conducted in accordance with standard operating procedures detailed in the 2018 Fort Jackson Integrated Cultural Resources Management Plan (ICRMP) (Army, 2018).

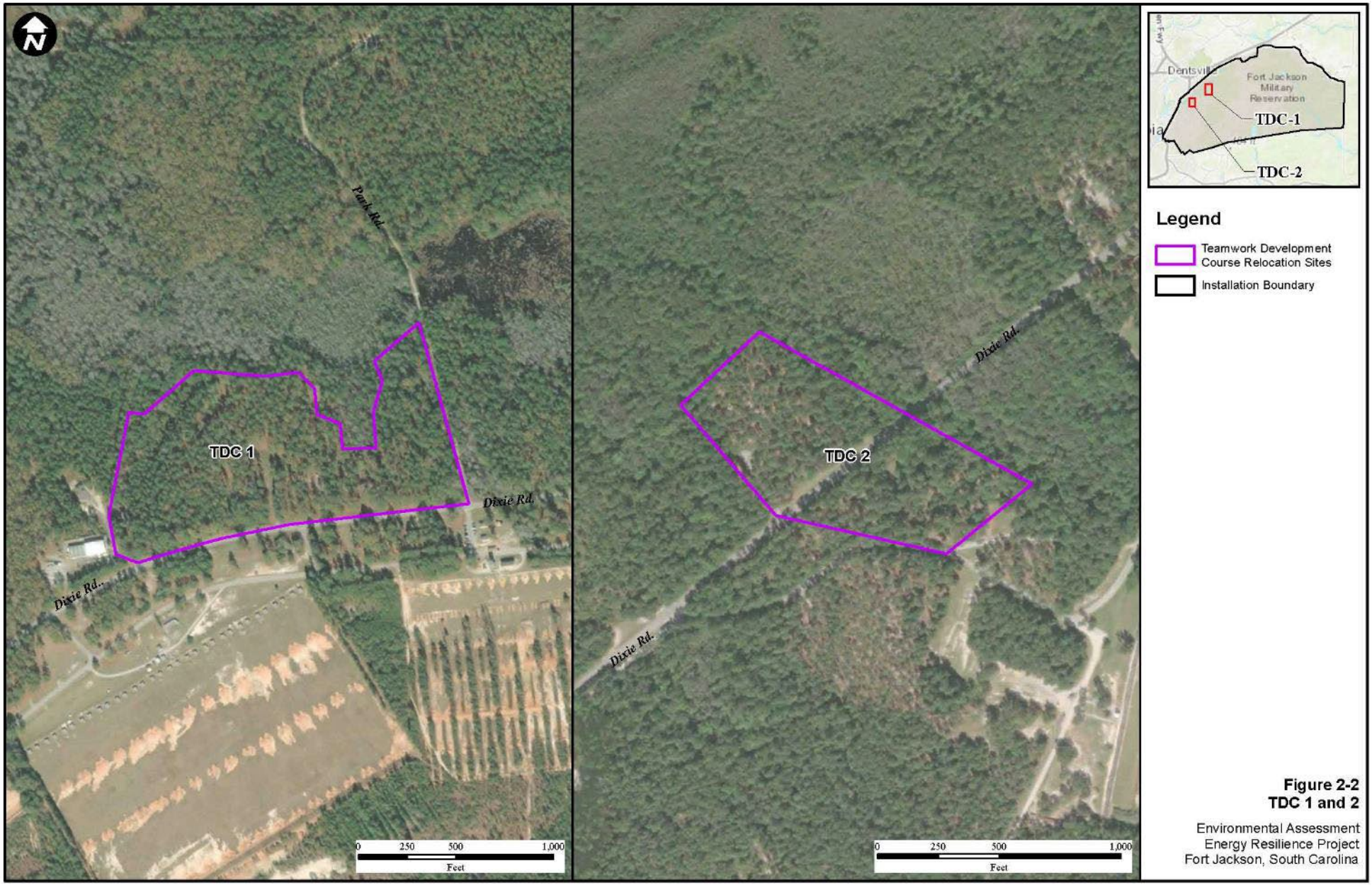

Figure 2-2
TDC 1 and 2

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Figure 2-3
Chesnut/Semmes/Ivy (COA 2)

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2.1.2 Description of Proposed Action for Natural Gas Generator Units

Two primary parcels have been identified for the siting of the Natural Gas Generator Units. The parcels and their development requirements are described in detail below.

Final design for the facility has not been completed. Additional infrastructure required for the facility may include access roads, parking areas, and potentially a maintenance building. Any additional infrastructure would be located within the development footprint detailed in **Figures 2-4 and 2-5**. The facility would be designed and constructed in a manner that is compatible with government uses on adjacent land.

2.1.2.1 Hill Street Substation (COA 3)

COA 3 is a 2.2-acre site located at the intersection of Lee Road and Hill Street (**Figure 2-4**). The site would be the location of the Natural Gas Generator Units. A substation located on the site is scheduled for demolition beginning in April 2024, after which the parcel will be available for development. The units would tie into the existing Hill Street substation located approximately 60 feet north of the proposed parcel. COA 3 is located within the Fort Jackson Municipal Separate Storm Sewer System (MS4) boundaries.

An eight-inch steel gas line would be constructed to provide a continuous feed of natural gas to the generator units. The line would be constructed from the Gate 1 roundabout through Marion Avenue and Anderson Street, then north along Lee Road to meet with the COA 3 generators (**Figure 2-5**). The proposed pipeline would tie in to the existing eight-inch pipeline at the Gate 1 roundabout. Trenching and Horizontal Directional Drilling (HDD) would be used to construct the pipeline.

2.1.2.2 Moseby Street Substation (COA 4)

COA 4 is a 2.1-acre site located north of the Moseby Street Substation at the intersection of Forrest Road and Nicholas Street (**Figure 2-6**). The parcel would be the location of the Natural Gas Generator Units. The units would tie into the existing Moseby Street substation located approximately 60 feet north of the proposed parcel.

An eight-inch steel gas line would run north from the Gate 1 roundabout along Jackson Boulevard, then west along Forrest Road for a total length of 9,000 feet (**Figure 2-7**). The proposed pipeline would tie in to the existing eight-inch pipeline at the Gate 1 roundabout. Trenching and HDD would be utilized to construct the pipeline. The line would extend a total of 13,000 feet.

Figure 2-4
Hill Street Substation (COA 3)

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Figure 2-5
Proposed Pipeline COA 3

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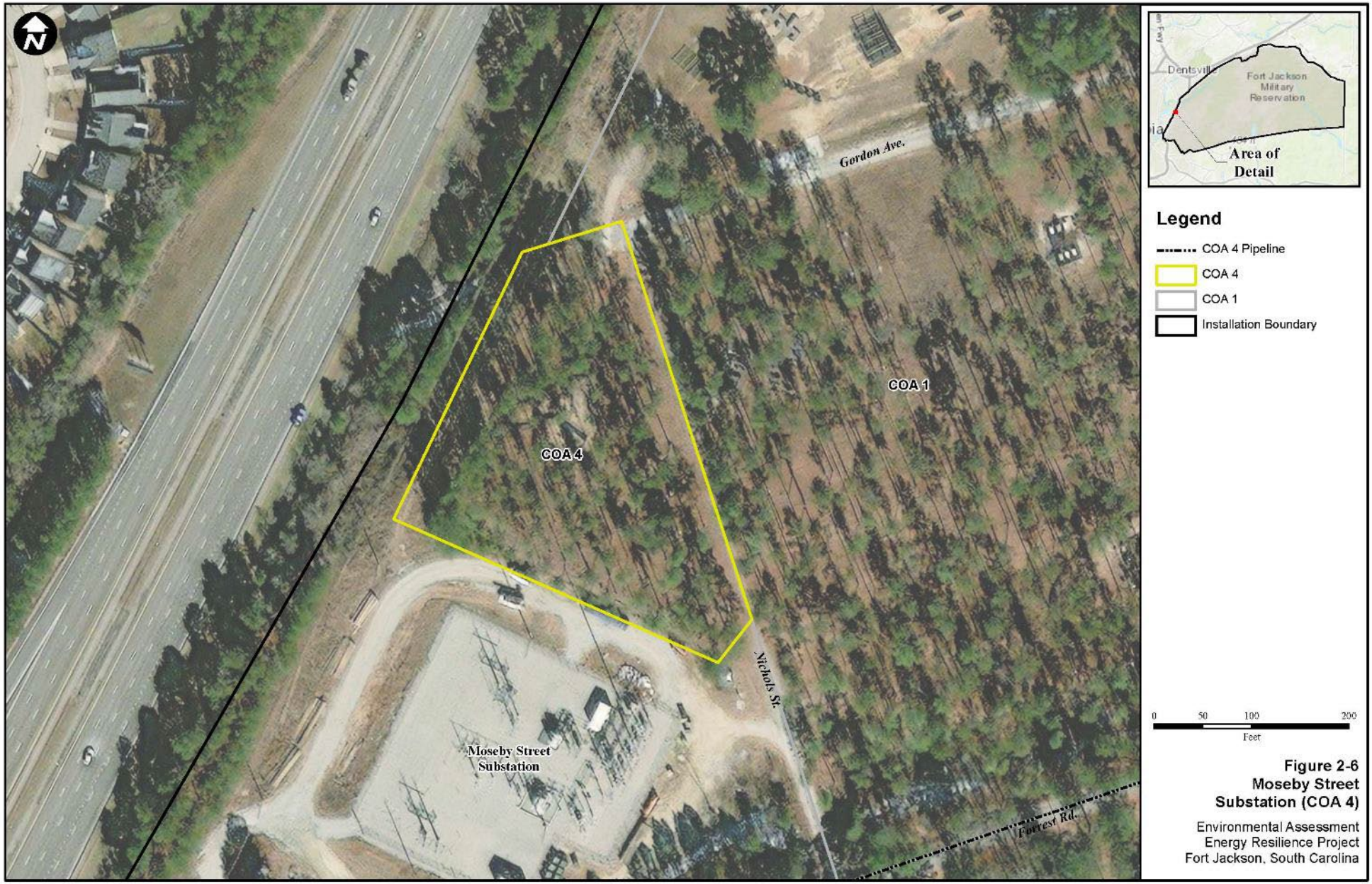

Figure 2-6
Moseby Street Substation (COA 4)

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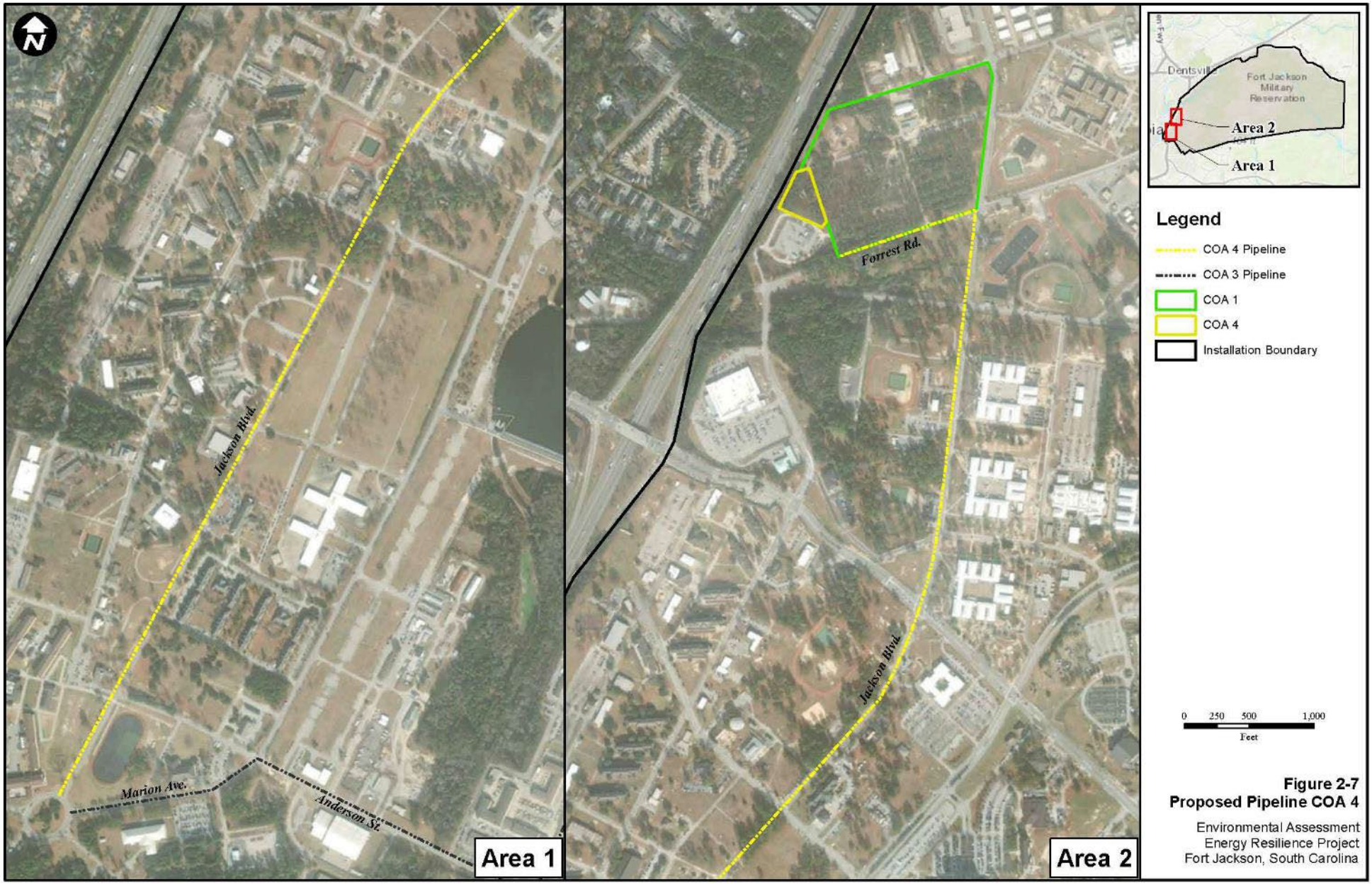

Figure 2-7
Proposed Pipeline COA 4

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2.2 SELECTION STANDARDS

This section outlines the selection standards that were used by the Army and supported component missions to develop and analyze these alternatives. Each development would adhere to the selection standards described below:

- Assure access to resource supplies.
- Improve infrastructure conditions.
- Increase Fort Jackson's energy and infrastructures resiliency, installation efficiency, and affordability.
- Parcel size appropriate to accommodate designed infrastructure.
- Avoid and/or minimize impacts to wetlands, streams, and floodplains.
- Avoid known protected species occurrence areas and/or habitat, specifically red-cockaded woodpecker (RCW) habitat planning areas, and tricolored bat roosting areas.
- Avoid areas with existing land use restrictions related to historical resource or safety concerns.
- Efficiently utilize available installation property to promote robust and efficient system operations.

2.3 SCREENING OF ALTERNATIVES

Alternatives for the proposed COAs were developed using the criteria described above to identify suitable development alternatives. The selection standards described in **Section 2.2** were applied to these alternatives to determine which alternative(s) could meet Army mission requirements and would fulfill the purpose and need for the action.

The alternatives that are included in this EA meet the selection standards described in **Section 2.2**. Alternatives that were initially considered but failed to meet the selection standards were screened from further analysis. The alternatives that were considered but not carried forward for detailed analysis are included in **Section 2.5**.

2.4 DETAILED DESCRIPTION OF THE ALTERNATIVES

Fort Jackson has identified individual alternatives for the Solar PV System and Natural Gas Generator Proposed Actions. The following sections provide descriptions of these alternatives.

2.4.1 Description of Proposed Action for Solar PV System

Fort Jackson and DESC have identified three alternatives that may meet requirements for the proposed development of a solar PV system. The No-Action alternative is also considered for the Proposed Action. The following sections provide descriptions of the four considered alternatives.

2.4.1.1 Alternative 1: COA 1, TDC-1

Under Solar PV Alternative 1, COA 1 would be developed for the siting of the solar PV system, and site TDC-1 would be selected for development of the new TDC course. Development of the parcels would include all elements described in **Section 2.1.1**.

2.4.1.2 Alternative 2: COA 1, TDC-2

Under Solar PV Alternative 2, COA 1 would be developed as described in Alternative 1; however, the TDC-2 parcel would be selected for relocation of the new TDC course. Development of the parcels would include all elements described in **Section 2.1.1**.

2.4.1.3 Alternative 3: COA 2

Under Solar PV Alternative 3, COA 2 would be developed as described in **Section 2.1.1**. No relocation of the existing TDC course would be required. Development of the parcels would include all elements described in **Section 2.1.1**.

2.4.1.4 No Action Alternative

Under the No Action Alternative for the Solar PV System, no parcel would be selected for development of the solar array, and no construction or demolition would take place. This alternative would not meet the goals or objectives identified by Fort Jackson to implement the energy resiliency project.

2.4.2 Description of Proposed Action for Natural Gas Generator Units

Fort Jackson and DESC have identified two alternatives that may meet requirements for the proposed development of the Natural Gas Generator Units. The No-Action alternative is also considered for the Proposed Action. The following sections provide descriptions of the three considered alternatives.

2.4.2.1 Alternative 1: COA 3

Under Natural Gas Generator Alternative 1, COA 3 would be developed for siting of the Natural Gas Generator Units. The natural gas supply pipeline would be constructed along Marion Avenue, Anderson Street, and Lee Road. COA 3 developments would include all elements detailed in **Section 2.1.2**.

Polychlorinated Biphenyl (PCB) contamination in substation soils is not confirmed, but possible due to the age of the substation equipment. If PCBs were to be detected, cleanup would be undertaken as a joint effort between Dominion Privatization South Carolina, a subsidiary of DESC, and the Fort Jackson Environmental Division.

2.4.2.2 Alternative 2: COA 4

Under Natural Gas Generator Alternative 2, COA 4 would be developed for siting of the Natural Gas Generator Units. The natural gas supply pipeline would be constructed along Jackson Boulevard and Forrest Road. COA 4 developments would include all elements detailed in **Section 2.1.2**.

2.4.2.3 No-Action Alternative

Under the No-Action Alternative for the Natural Gas Generator Units, no parcel would be selected, and there would be no site preparations for any equipment described in **Section 2.1.2**. No Natural Gas Generators Units would be constructed. This alternative would not meet the purpose and need identified by Fort Jackson to implement the energy resiliency project.

2.5 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD FOR DETAILED ANALYSIS

2.5.1 BA-4

BA-4 is an approximately 45-acre parcel with suitable site characteristics for location of the solar array. The parcel is not part of RCW habitat planning and is both accessible and adjacent to contractor service area. The site was previously used as a landfill. This site is the smallest of the Solar PV system COAs reviewed. The site history and parcel size removed this alternative from further consideration.

2.5.2 BA-9

BA-9 is an approximately 185-acre parcel considered to site the Solar PV system. The parcel has undulating terrain, reducing the full utilization of parcel for the solar PV system. The parcel did not represent an efficient use of installation property and was sited in a logistically inadequate location.

2.5.3 BA-10

BA-10 is an approximately 70-acre parcel considered to site the Solar PV system. The parcel is heavily wooded and would require significant vegetation clearing. The area was previously used as a landfill, so the location was deemed not viable due to safety and foundation concerns.

2.5.4 BA-11

BA-11 is an approximately 188-acre parcel with suitable site characteristics for location of the Solar PV system. This parcel is not part of RCW habitat planning and does not have prior timber or training issues. The BA-11 parcel is accessible by timber roads and is adjacent to the contractor service area. Existing land use restrictions from historic small arms ranges deem the site not available for development, and therefore the alternative was eliminated from further consideration.

2.5.5 Site 5

Site 5 is an approximately 139-acre parcel considered to site the Solar PV system. Development of the parcel for operation of a solar array would encroach on RCW habitat planning areas and was therefore eliminated from further consideration.

2.5.6 Site 1 and Site 3

Site 1 TDC was considered for construction across from the range operations office. The Site 3 TDC was considered for construction north of the existing softball fields. The two parcels were eliminated due to their logistically inconvenient locations and proximity to existing training elements.

Figure 2-8
Alternatives Considered but Not Carried Forward

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3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the affected environment, environmental consequences, and cumulative effects for implementation of the Proposed Action, the proposed alternatives, and the No Action Alternative.

Descriptions of the project elements and environmental resources provide the basis for analysis of potential effects on the environment from the Proposed Action and No Action Alternative. Site-specific information presented in this section is derived from on-site evaluation and information obtained from Fort Jackson personnel, historical reports, and available public information resources. General and relevant background information regarding Fort Jackson is also provided in multiple base-wide management plans.

During the preliminary analysis process, resources were evaluated for their potential to be impacted by the Proposed Action. Wastewater Systems (Utilities Section) and Groundwater (Water Resources Section), two resources normally evaluated by Fort Jackson, were considered for analysis but dismissed from further review. Analysis of impacts to wastewater systems was eliminated from analysis since the Proposed Action would not require a wastewater tie-in or otherwise affect wastewater capacities. Similarly, impacts to groundwater were not analyzed since early review indicated that the Proposed Action would not affect groundwater recharge or require groundwater withdrawals. The Proposed Action was analyzed, as discussed in the sections below, for all beneficial or adverse effects to resources in and around Fort Jackson.

3.1 AIR QUALITY

3.1.1 Affected Environment

This section describes the existing air quality conditions at and surrounding Fort Jackson. Air quality is determined by the type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a region or geographical area is determined by comparing it to federal and/or state ambient air quality standards. Under the authority of the Clean Air Act (CAA) (42 U.S.C. 7401 et seq.), the United States Environmental Protection Agency (USEPA) has been given the responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR 50) for pollutants considered harmful to public health and the environment, with an adequate margin of safety.

3.1.1.1 Ambient Air Quality Standards

USEPA established NAAQS for six common air pollutants (known as criteria air pollutants): carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), Ozone (O_3), sulfur dioxide (SO_2), and particulate matter with a diameter less than or equal to 2.5 micrometers ($PM_{2.5}$) and less than or equal to 10 micrometers (PM_{10}). The NAAQS are standards to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly, as well as to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Short-term NAAQS (1-, 8-, and 24-hour averages) have been established for pollutants contributing to acute, or short-term, health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. Each state has the authority to adopt standards that are more stringent than those established under the federal program. **Table 3-1** provides the ambient air quality standards set forth by the USEPA for South Carolina.

Table 3-1: Ambient Air Quality Standards

Criteria Pollutant	Measuring Interval	Standard Level
SO_2	3 hours (secondary)	1300 µg/m^3 or 0.5 ppm
	24 hours (primary)	365 µg/m^3 or 0.14 ppm
	Annual (primary)	80 µg/m^3 or 0.030 ppm
	1 hour (secondary)	75 ppb
PM_{10}	24 hours	150 µg/m^3
$PM_{2.5}$	24 hour (primary)	35 µg/m^3
	Annual (primary)	12 µg/m^3
	24 hour (secondary)	35 µg/m^3
	Annual (secondary)	15 µg/m^3
CO	1 hour (no secondary)	40 mg/m^3 or 35 ppm
	8 hour (no secondary)	10 mg/m^3 or 9 ppm
O_3	8 hours (2008)	0.075 ppm
	8 Hours (2015)	0.070 ppm
NO_2	Annual	100 µg/m^3 or 0.053 ppm or 53 ppb
	1 hour	100 ppb
Pb	Rolling 3 month average	0.15 µg/m^3

Notes: ppb = parts per billion; ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter
Source: South Carolina Air Pollution Control - Regulation No. 62.5 - Air Pollution Control Standard No. 2 Ambient Air Quality Standards.

Federal regulations designate Air Quality Control Regions (AQCRs) in violation of the NAAQS as nonattainment areas. Federal regulations designate AQCRs with levels below the NAAQS as attainment areas. According to the severity of the pollution problem, nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme.

3.1.1.2 Local Air Quality

South Carolina represents one of 28 eastern states under the Clean Air Interstate Rule (CAIR), a program to permanently cap emissions of SO_2 and NO_2. CAIR assists South Carolina in meeting and maintaining NAAQS for ground-level ozone and fine particle pollution (SO_2 and NO_2 contribute to the formation of fine particles (PM), and NO_2 contributes to the formation of ground-level ozone).

Fort Jackson is located entirely in Richland County. In 2007, Richland County was classified as in attainment for all six criteria pollutants. The Regional Haze Rule calls for state and federal agencies to work together to improve visibility in 156 national parks and wilderness areas.

According to 40 CFR 81, no Class I areas are located 10 kilometers of Fort Jackson (USEPA, 2023b).

According to the USEPA, ambient air quality below 85% of a NAAQS could be considered significantly (or definitively) below the standard and may be defined as “clearly attainment”. Therefore, ambient air quality within 15% of a NAAQS could be considered questionably below the standard and may be defined as “questionable attainment”.

Several South Carolina Air Monitoring Network stations are, or were, located in Richland County near Fort Jackson. In combination, these stations measure SO_2, $PM_{2.5}$, O_3, and NO_2 concentrations. A design value is a statistic that describes the air quality status of a given location relative to the level of the NAAQS. The USEPA has computed county-level design values for Richland County based upon data collected at the monitoring stations.

On the basis of these air quality measurements, Fort Jackson is located in an area that is clearly in attainment with the NAAQS for CO, PM_{10}, $PM_{2.5}$, NO_2 and SO_2. The area is questionably in attainment with the NAAQS for O_3 and Pb. Note the design values for NO_2 did not meet the data completeness requirements.

Fort Jackson currently operates under an air permit issued by the South Carolina Department of Health and Environmental Control (SCDHEC). Permit requirements include an annual inventory for all significant stationary sources of air emissions and covers monitoring, recordkeeping, and reporting requirements and updated, as necessary. Any new stationary sources of air emissions would be reviewed by the Installation's Air Program Manager to determine if they would be subject to air permitting regulations. Any required permits (e.g., SCDHEC construction permit) would be obtained or modified accordingly prior to installation and operation. Fort Jackson’s 2020 installation-wide air emissions for all stationary sources are listed below in **Table 3-2** (USEPA, 2023b).

Table 3-2: Fort Jackson Emissions from Stationary Sources

Pollutant	Emissions (tons/year)
SO_2	0.26
NOx	28.47
CO	44.24
VOCs	99.15
$PM_{10}/PM_{2.5}$	16.43

Notes:
NOx = Nitrogen Oxides;
VOC = Volatile Organic Compound

3.1.1.3 Approach to Analysis

For air quality impact assessments, significance is defined by the degree to which the effects of a Proposed Action component could potentially affect public health or safety. Air quality impact significance is defined by an action’s potential to cause or contribute to a new violation of one or more of the primary NAAQSs. In other words:

- Insignificant = Action does not cause or contribute to exceeding one or more NAAQSs
- Significant = Action does cause or contribute to exceeding one or more NAAQSs

Fort Jackson is located in an air quality attainment area. There are no established significant thresholds for attainment areas; however, as defined by the Prevention of Significant Deterioration (PSD) regulation [40 CFR 52.21(b)(1)(i)], a major stationary source is one that emits or has the potential to emit greater than 250 ton/yr of a criteria pollutant. This threshold is one of the CAA's triggers for a new major source or a source making a major modification in an attainment area. In an area that is clearly in attainment with the NAAQS, such as Fort Jackson, the 250 ton/yr PSD threshold is an indicator of potentially significant air quality impacts for NEPA.

In an area that is near nonattainment (i.e., within 5% of a specific NAAQS), lower emission thresholds, as defined by the General Conformity Rule, are used as an indicator of potentially significant air quality impacts for NEPA. The General Conformity de minimis values are 100 tons/yr for CO, NO_x, PM_{10}, $PM_{2.5}$, SO_2, and VOC, and 25 tons/yr for Pb [40 CFR 93.153(b)(1) and (2)]. For Fort Jackson, the insignificant indicators are identified in **Table 3-3**.

Table 3-3: Air Quality Insignificant Indicators for Fort Jackson

Criteria Pollutant	Insignificant Indicator (tons/yr)
SO_2	250
PM_{10}	250
$PM_{2.5}$	250
CO	250
NO_x	100
VOC	100
Pb	25

The Proposed Action components that would emit (or have the potential to emit) less than he values defined in **Table 3-3** would be deemed insignificant. This is because the indicator would suggest that the action would not cause or contribute to exceeding one or more of the NAAQS.

3.1.2 Environmental Consequences

Air emissions resulting from implementation of each alternative were evaluated in accordance with Federal, state, and local air pollution standards and regulations. Air quality impacts resulting from each alternative are defined as those that raise ambient air pollution levels above any NAAQS, factor into an existing NAAQS violation, or hinder or postpone NAAQS attainment per the CAA.

3.1.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Short-term increases in air emissions are expected during the demolition and construction phases of Alternative 1; however, these effects would result in no significant impacts to air quality. The demolition and construction activities associated with the Proposed Action would generate air pollutant emissions from site-disturbing activities such as grading, filling, compacting, and trenching, and from the operation of construction and demolition equipment and haul trucks that would transport construction supplies, excavation material, and demolition debris.

During construction, precautions outlined in the South Carolina Air Pollution Control Regulations (SCAPCR), such as controlling fugitive dust, would be required. All contractors would comply with Federal, state, and local air regulations. All persons responsible for any operation, process, handling, transportation, or storage facility that could result in fugitive dust would take precautions to prevent such dust from becoming airborne. Best Management Practices (BMPs) during land clearing operations and construction activities assist in minimizing the release of dust.

No long-term increases in emissions would occur from the implementation of this alternative. As there would be no significant increase in emissions, pollution levels would not exceed NAAQS, and the Proposed Action would be in compliance with the CAA.

Alternative 2 – COA 1, TDC-2

The air emissions resulting from Alternative 2 would be nearly identical to those resulting from Alternative 1. Given that the results of Alternative 1 were found to be insignificant, additional analysis are not warranted to capture air emissions of Alternative 2.

Alternative 3 – COA 2

The air emissions resulting from Alternative 3 would be nearly identical to those resulting from Alternative 1. Given that the results of Alternative 1 were found to be insignificant, additional analysis are not warranted to capture air emissions of Alternative 3.

No Action Alternative

The No Action Alternative would not affect ambient air quality. No new air emissions would be generated.

3.1.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Short-term increases in air emissions are expected during the demolition and construction phases of the Proposed Action; however, these effects would result in no significant impacts to air quality. The demolition and construction activities associated with the Proposed Action would generate air pollutant emissions from site-disturbing activities such as grading, filling, compacting, and trenching, and from the operation of construction and demolition equipment and haul trucks that would transport construction supplies, excavation material, and demolition debris.

During construction, precautions outlined in the SCAPCR, such as controlling fugitive dust, would be required. All contractors would comply with Federal, state, and local air regulations. All persons responsible for any operation, process, handling, transportation, or storage facility that could result in fugitive dust would take precautions to prevent such dust from becoming airborne. BMPs during land clearing operations and construction activities assist in minimizing the release of dust.

Long-term (i.e., steady state) increases in air emissions are expected due to the operation of the generators. The generators are assumed to operate at full capacity (25 MW), 24 hours per day, and 14 days per year. The calculation of air emissions from Alternative 1 is presented in **Appendix B** and summarized in **Table 3-4**.

Table 3-4 demonstrates that steady state emissions would be less than the insignificant indicator values and do not warrant further NEPA analysis. The Proposed Action would have a negligible indirect impact on air quality. All emissions are below the insignificance indicator and would

therefore result in no significant impacts to air quality. Pollution levels would not exceed NAAQS, and the Proposed Action would be in compliance with the CAA.

Table 3-4: Summary of Steady State Air Quality Impacts from Alternative 1

Criteria Pollutant	Air Pollutant emissions (tons/year)	Insignificant Indicator (tons/year)	Significant Impact?
SO_2	0.02	250	No
PM_{10}	0.39	250	No
$PM_{2.5}$	0.39	250	No
CO	24.84	250	No
NO_x	49.68	100	No
VOC	12.42	100	No
Pb	0	250	No

Alternative 2 – COA 4

The air emissions resulting from Alternative 2 would be nearly identical to those resulting from Alternative 1. Given that the results of Alternative 1 were found to be insignificant, additional analysis are not warranted to capture air emissions of Alternative 2.

No Action Alternative

The No Action Alternative would not affect ambient air quality. No new air emissions would be generated.

3.2 CLIMATE CHANGE

3.2.1 Affected Environment

Greenhouse gases (GHGs) are chemical compounds in the Earth's atmosphere that allow incoming short-wave solar radiation but absorb long-wave infrared radiation re-emitted from the Earth's surface, trapping heat in the atmosphere. Most studies indicate that the Earth's climate has warmed over the past century due to increased emissions of GHGs, and that human activities affecting emissions to the atmosphere are likely an important contributing factor. A warmer climate is expected to increase the risk of heat-related illnesses and death, worsen conditions for air quality, allow some diseases to spread more easily, and increase the frequency and strength of extreme events (such as floods, droughts, and storms) that threaten human health and safety (USEPA, 2015).

Gases exhibiting greenhouse properties come from both natural and human sources. Water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are examples of GHGs that have both natural and manmade sources, while other GHGs such as chlorofluorocarbons are exclusively manmade. In the U.S., most GHG emissions are attributed to energy use. Such emissions result from combustion of fossil fuels used for electricity generation, transportation, industry, heating, and other needs. Reduction goal requirements applicable to federal agencies are set forth in EO 13693, *Planning for Federal Sustainability in the Next Decade*.

CEQ's *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change* provides guidance regarding NEPA air quality assessments

(CEQ, 2023). This document recommends that agencies quantify a Proposed Action's projected direct and indirect GHG emissions.

Significance indicators are USEPA thresholds applied out of context to their intended use that do not provide definitive impact determination but rather evidence to the potential significance of GHG emissions on climate change. The USEPA has established a requirement for GHG emissions to undergo a Best Available Control Technology (BACT) analysis under the PSD permit program. If a permitting project would emit or has the potential to emit 75,000 short tons (2,000 pounds per short ton) per year of CO_2 equivalents (CO_{2e}), and would otherwise be subject to the PSD requirements, then a BACT analysis must be performed on the GHG emissions. This value was used as the significance indicator for the Proposed Actions included in this EA.

In addition, the effects of climate change on the Proposed Action's and/or the environment should be included to address and document that an informed decision-making process was followed. For smaller projects [i.e., actions generating less than 75,000 short tons per year CO_{2e}], discussion of two subjective qualitative assessments should be minimal, where the two subjective assessments are:

1. Impact of climate change on the Proposed Action; and
2. Impact of climate change on the environmental impacts of the Proposed Action.

3.2.2 Environmental Consequences

Each GHG is assigned a global warming potential, which is the ability to trap heat, and is standardized to CO_2, which has a global warming potential value of one. A GHG is multiplied by its global warming potential to calculate the total equivalent emissions of CO_{2e}. To evaluate GHG emissions, air emission estimates for the Proposed Action components were calculated in terms of CO_{2e}.

In guidance issued on January 9, 2023, CEQ proposed interim guidance for analysis of GHGs and climate change effects. A particular quantity of GHG emissions as "significant" or "insignificant" relating to impacts to the environment or climate change was not established. On October 3, 2016, USEPA proposed establishing a de minimis value of GHGs or "Significant Emissions Rate" of 75,000 tons per year (tpy) CO_{2e} from stationary sources as a basis for requiring sources to obtain a Title V permit if the sources were not otherwise required to obtain a Title V permit. As the USEPA rule establishes a "significant emissions rate" threshold of 75,000 tpy CO_{2e} it is used as an indicator of de minimis significance; actions resulting in less than 75,000 tpy CO_{2e} of GHG emissions are considered de minimis (too trivial or minor to merit consideration) and not significant enough to warrant further NEPA analysis.

To reduce greenhouse gas emissions during the construction phase of all Proposed Action components, BMPs including the avoidance of unnecessary idling of construction equipment, and maintaining construction equipment in good operating condition, would be utilized as required.

3.2.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Temporary, short-term adverse climate change impacts would be expected as a result of vehicle exhaust from construction vehicles and equipment under Alternative 1. However, these and other

potential construction-related impacts are not anticipated to result in substantial increases of GHGs. Construction under Alternative 1 will require removal of vegetation and, for trees and taller shrubs removed, preclude regeneration of vegetation, resulting in less natural carbon sequestration.

Operation of the Solar PV System could result in long-term beneficial impacts to overall GHG emissions at Fort Jackson and within the region. By off-setting a commensurate amount of electricity using solar-produced electricity, Fort Jackson would consume less fossil fuel-derived electricity attributable to an installation's electrical demand.

Alternative 2 – COA 1, TDC-2

Impacts under Alternative 2 would be the same as those described under Alternative 1. Temporary, short-term adverse climate change impacts are expected from construction activities; however, long-term beneficial impacts are expected from the clean energy offset provided by solar generation.

Alternative 3 – COA 2

Impacts under Alternative 3 would be the same as those described under Alternative 1. A larger forested area would be removed under Alternative 3, resulting in a further reduction in carbon sequestration capabilities compared to Alternative 1 and 2. Temporary, short-term adverse climate change impacts are expected from construction activities; however, long-term beneficial impacts are expected from the clean energy offset provided by solar generation.

No Action Alternative

The No Action Alternative would result in higher GHG emissions than Alternatives 1, 2, and 3.

The volume of energy delivered to, and generated by, Fort Jackson from GHG producing sources would remain the same. Because there would be no clean energy offset provided by the Solar PV System, long-term, minor impacts are expected from implementation of the No Action Alternative.

3.2.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Long-term (i.e., steady state) increases in GHGs are expected due to the operation of the generators and construction activities. The generators are assumed to operate at full capacity (25 MW), 24 hours per day, and 14 days per year. The calculation of GHGs emitted through implementation of the Natural Gas Generator Units Proposed Action expressed as CO_{2e} is 4,618 tons/year. This is under the significance indicator of 75,000 tons/year; therefore, these values do not warrant further NEPA analysis. Results and calculations are presented in **Appendix B.**

Construction under Alternative 1 will require removal of vegetation, which would preclude regeneration of vegetation and result in less natural carbon sequestration.

Based on calculated CO_{2e} emissions under the Proposed Action, there would be a negligible indirect impact on climate change under Alternative 1.

Alternative 2 – COA 4

Impacts under Alternative 2 would be the same as those described under Alternative 1. Negligible indirect impact on climate change is expected.

No Action Alternative

The No Action Alternative would not result in any significant environmental impacts on climate change because the GHG emission would not change significantly, over time, from the current condition.

3.3 NOISE

Noise is generally defined as undesirable sound. Sound is all around us, becoming noise when it interferes with normal activities such as speech, concentration, or sleep, is intense enough to damage hearing, or is otherwise intrusive. The type and characteristics of the noise, distance between the noise source and the receptor, the receptor sensitivity, and time of day all cause variations in human response. Noise is often generated by human activities that are fundamental to the quality of life, such as construction or vehicular traffic.

3.3.1 Affected Environment

Noise associated with military installations is a factor in land use planning both on- and off-installation. Noise emanates from vehicular traffic associated with new facilities and from project sites during construction. Ambient noise (the existing background noise environment) can be generated by a number of noise sources, including mobile sources, such as automobiles and trucks, and stationary sources such as construction sites, machinery, or industrial operations. In addition, there is an existing and variable level of natural ambient noise from sources such as wind, streams and rivers, and wildlife.

Fort Jackson has five helicopter landing zones within the cantonment area mainly used for emergency medical evacuation. Aircraft stationed at McEntire Joint National Guard Base conduct low-level training. Pilots comply with National Guard Regulation (NGR-95-1) to maintain minimum altitudes of 500 feet above ground level for unpopulated areas, 1,000 feet above ground level for populated areas, and 800 feet above ground level for the installation (NGB, 2018). A study of noise generators and noise impacts conducted by the United States Army Public Health Center (USAPHC) noted that the primary noise generators were small arms, demolition, and artillery. The Installation Compatible Use Zone Study (ICUZ) was updated using the noise contours developed by the USAPHC to aid in the process of identifying areas which experience high levels of noise (USAPHC, 2017). The study resulted in the mapping of areas that are within the contour lines of Noise Zones II and III:

- Zone II is where the sound level is between an A-weighted sound level (dBA) measurement of between 65 and 75 dBA day-night level (DNL). It is considered to have a significant noise exposure and is "normally unacceptable" for noise-sensitive land uses.
- Zone III is where the DNL is greater than 75 dBA. It is considered an area of severe noise exposure and is unacceptable for noise-sensitive activities.

When substantial changes occur in the type, frequency, or size of range operations, new noise contour models are prepared, and the results are appended to the ICUZ study or a new ICUZ is

prepared. While noise complaints are not frequent, the Operational Noise Management Plan (ONMP) provides guidelines for noise management pertaining to Installation functions. The goal of the ONMP is to achieve compatibility between the Army and the surrounding communities so that soldier training will not be interrupted or restricted due to public concern over noise levels produced. The ONMP listed the following conclusions from a 2009 analysis (Army Center for Health Promotion and Preventive Medicine [USACHPPM], 2009):

- The Noise Zones from small arms training are contained within the Installation boundaries.
- Due to deployments and reorganizations, current large caliber operations are not frequent enough to generate Noise Zone II or Noise Zone III levels.
- Large caliber operations may produce peak noise levels that can generate a moderate or high risk of complaints beyond the Installation boundary.

Fort Jackson has established sound buffer areas adjacent to portions of the perimeter to mitigate any potential for disturbance of noise-sensitive uses located off-installation. These zones, which are approximately 900 meters wide, are located adjacent to Leesburg Road and Highway 601 along the southern and eastern borders of the installation, respectively. The McCrady Training Center (MTC), located in the south-eastern portion of the Installation, is also a contributor to noise generation. While MTC is contained within the boundary, its missions, operations, and administration are autonomous and separate from Fort Jackson.

COA 1, TDC-1

Currently at COA 1, active training activities on the TDC Course are the primary source of noise. Industrial and traffic noise from adjacent roadways are also common in the area. COA 1 is adjacent to Interstate 77, which is a six-lane highway with a high volume of vehicle and large truck traffic. The interstate serves as a major transportation conduit for both residential Columbia metropolitan area traffic, and interstate travelers. Noise levels within this area are typically elevated by vehicular traffic during nearly all daylight hours. There are limited noise-generating activities currently at the proposed TDC-1 site, which is limited to infrequent use for troop activities. TDC-1 is located across Dixie Road from several active firing ranges.

COA 1, TDC-2

Existing noise at COA 1 is described above. There are limited noise-generating activities currently at the proposed TDC-2 site, which is limited to infrequent use for troop activities. TDC-2 is bisected by Dixie Road and is located close to two active firing ranges to the southeast.

COA 2

Existing noise at COA 2 is mainly generated from traffic noise from three adjacent roads (Chesnut Road, Semmes Road, and Ivy Road). Athletic fields are located to the northwest, residences are located to the west, golf courses are located to the southwest and south, and the Contractor Area and Palmetto State Utility Services (PSUS) facility are located to the east.

COA 3

Existing noise at COA 3 is mainly generated from traffic noise from two adjacent roads (Hill Street and Lee Road). An existing substation is located to the north, and the Post Exchange Mini Mall is located across Lee Road.

The proposed COA 3 pipeline would be installed along Lee Road, Anderson Street, and Marion Avenue right-of-ways, adjacent to numerous commercial and industrial facilities, as well as housing, recreation, and training areas.

COA 4

Currently at COA 4, active training activities on the adjacent TDC Course are the primary source of noise. Industrial and traffic noise from adjacent roadways are also common in the area. COA 4 is adjacent to Interstate 77, therefore noise levels within this area are typically elevated by vehicular traffic during nearly all daylight hours.

3.3.1.1 Regulatory Overview

The Noise Control Act of 1972 (Public Law 92-574) directs Federal agencies to comply with applicable Federal, state, and local noise control regulations. In 1974, the USEPA provided information suggesting continuous and long-term noise levels in excess of 65 dBA DNL are unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. South Carolina's Environmental Noise Act of 1974 limits noise to a level which will protect the health, general welfare, and property of the people of the state. The Richland County Noise Ordinance (Chapter 18, Section 18-3) maintains that noise levels in excess of 62 dBA between the hours of 7:00 a.m. and 10:00 p.m. and 55 dBA between the hours of 10:00 p.m. and 7:00 a.m. are unlawful, and that non-residential operation of construction equipment shall not be used between the hours of 10:00 p.m. and 6:00 a.m. (Chapter 26, Section 26-97). The Region of Interest (ROI) is Fort Jackson and its surrounding areas.

3.3.2 Environmental Consequences

3.3.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Construction under Alternative 1 would lead to an increase in noise during construction and site preparation activities; however, these increases would be minor, short-term, and temporary and would cease once the construction is complete. Construction noise would be related to demolition, construction activities, heavy equipment operation, and vehicle traffic. BMPs such as limiting work to daylight hours and avoiding the unnecessary idling of construction equipment would be implemented to reduce noise during development activities and to comply with Federal and State noise requirements. No long-term increases in noise or impacts to the noise environment would occur from Alternative 1.

There would be limited noise generated by the Solar PV system and relocated TDC training activities after construction and during operations. These noise sources are minor in comparison to other industrial-related activities and firing ranges in the project area. Additionally, the existing noise environment near COA 1 is influenced by Interstate 77. Noise levels within this area are typically elevated by vehicular traffic during nearly all daylight hours. On-base personnel expect elevated noise levels due to the nature of installation activities and are protected in accordance with the Department of Defense (DoD) and Occupational Safety and Health Administration (OSHA) health and safety requirements, where applicable. There would be no long-term or significant impacts to the overall noise environment from Alternative 1.

Alternative 2 – COA 1, TDC-2

Impacts and noise-limiting BMPs under Alternative 2 would be the same as described under Alternative 1. No significant impacts are anticipated.

Alternative 3 – COA 2

COA 2 shares its western border with a military housing area. Additionally, Pinckney Elementary School and Pierce Terrace Elementary School are located 0.35 miles north and 0.41 miles west of the COA boundary, respectively. The noise level increase during construction would be short-term and temporary, as described in Alternative 1. Peak noise levels are anticipated to be attenuated by existing vegetation, which acts as a noise buffer. There would be limited noise generated by the Solar PV system after construction and during operations. These noise sources are minor in comparison to other industrial-related activities and traffic in the project area. Impacts associated with any potential increases to levels of vehicle traffic would be negligible given the existing noise environment. Therefore, there would be no significant impacts to the noise environment as a result of Alternative 3.

No Action Alternative

The No Action Alternative would not result in any significant or negative impacts to noise levels, as noise-generating construction activities would not occur.

3.3.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Construction under Alternative 1 would lead to an increase in noise during construction and site preparation activities. COA 3 is located within close proximity to the Hood Street School Age Services Building (300 feet northeast), Lee Road Child Development Center (CDC) (850 feet northeast), Hood Street CDC (850 feet north), and Scales CDC (900 feet north). Construction of the pipeline would result in negligible, short-term noise impacts during development activities. Noise-reduction BMPs would be implemented to reduce noise during development activities and to comply with Federal and State noise requirements.

Elevated noise levels are expected during operation of the Natural Gas Generator Units. Operations are only anticipated to be conducted during occasional testing and in the event supplemental power is needed to support the installation, at which point the generators would run for a maximum of 14 days. The noise would not be out of character with existing noise in the area. The Lee Road CDC and a military housing development are located approximately 800 feet northeast, and 1,000 feet south of COA 3, respectively. Both areas may contain populations sensitive to elevated noise levels.

Typical natural gas generators feature acoustically designed exteriors to ensure that occupational and environmental noise thresholds are met outside of the generator enclosure. The assumed generators for this project (Hyundai 18H35/40GV or equivalent) are designed to have low vibration and limited noise emissions outside of their enclosures. Silencers installed on exhaust stacks and air intakes are also typical of modern generators. Construction of the proposed Natural Gas Generator Units are anticipated to include these noise control measures and comply with installation and local noise emission standards. Within any areas that would intermittently exceed

85 dB, workers constructing, operating, and maintaining the generator system would be required to wear appropriate hearing protection devices.

Minimal changes are expected to the noise environment due to the use of noise control measures implemented in the generator design, and natural attenuation by existing vegetation. Therefore, the Proposed Action under Alternative 2 is expected to result in long-term, negligible impacts to the noise environment.

Alternative 2 – COA 4

Noise impacts from construction of the Natural Gas Generator Units and pipeline under Alternative 2 would be the same as described under Alternative 1. Appropriate noise-reduction BMPs would be implemented to reduce noise during development activities and to comply with Federal and State noise requirements.

Elevated noise levels are expected during operation of the Natural Gas Generator Units. The existing noise environment near COA 4 is dominated by Interstate 77. Noise levels within this area are typically elevated by vehicular traffic during nearly all daylight hours. COA 4 is located approximately 350 feet southwest of an off-installation housing development; however, the existing noise environment precludes this sensitive noise receptor from any possibility of being impacted. No significant long-term impact is anticipated from development under Alternative 2.

No Action Alternative

The No Action Alternative would not result in any significant or negative impacts to noise levels, as noise-generating construction activities would not occur, and no generators would be installed.

3.4 LAND USE

This section describes the existing land use regulated by management plans, policies, and regulations that determine the type and extent of land use allowable in specific areas, as well as the protection specifically designated for environmentally sensitive areas. The natural land use classifications include wildlife areas, forests, and other open or undeveloped areas. The human-modified land use classifications include residential, commercial, industrial, utilities, agricultural, and recreational uses. The land use in the area is regulated by management plans, policies, and regulations that determine the type and extent of land use allowable in specific areas, with specific provisions for environmentally sensitive areas. The ROI for land use is Fort Jackson.

3.4.1 Affected Environment

Fort Jackson encompasses approximately 51,316 acres of land and is surrounded by a 3,000-foot buffer. The majority of the base is range area, which includes approximately 17,000 acres of range/training areas and 11,000 acres of impact areas. The cantonment area consists of 5,500 acres and includes administrative buildings, troop housing (barracks) and family housing, retail and commercial businesses (e.g., the commissary, bank, and gas station), medical centers, schools, recreation areas, motor pools, and other mission support facilities. The remainder of the acreage is managed woodlands. Fort Jackson also has outgrants in the form of easements, leases, licenses, and permits. Examples of these include easements for utility lines that grant utility service providers access to the line for maintenance, leases for cellular communication towers, and licenses for the use of Army buildings/land by private organizations.

All COA properties, including pipelines associated with COA 3 and COA 4, are located within the cantonment area. However, both TDC-1 and TDC-2 are located outside the cantonment area in managed forestland. COA 1 and COA 4 are located on land designated for training operations. The COA 2, TDC-1, and TDC-2 parcels are designated for forest land use. COA 3 is located on land designated for industrial use.

No parcels considered for development include environmentally sensitive areas or land use restrictions.

3.4.2 Environmental Consequences

Potential impacts to land use are evaluated with respect to the extent, context, and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. The methodology to assess impacts on individual land uses requires identifying those uses and determining the degree to which they would be affected by each alternative. The significance of potential land use impacts is based on the level of land use sensitivity in affected areas.

3.4.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Land use within the COA 1 parcel is currently designated for training operations. Under Alternative 1, the land use would be changed from training to industrial. While this would result in the temporary reduction of land designated for training (33 acres), development of TDC-1 (29.1 acres) under a training operations land use would offset any potential long-term impacts to training areas. TDC-1 is currently designated for forest land use but is partially developed and located within close proximity to training ranges. Alternative 1 would therefore result in negligible long-term impacts to land use as a result of the long-term and potentially permanent transition from training to industrial use. Recreational land use parcels to the south and residential parcels to the west are not anticipated to be impacted.

Alternative 2 – COA 1, TDC-2

Land use designations for the COA 1 and TDC-2 parcels are the same as described in Alternative 1. The 15.2 acre TDC-2 is not developed but is adjacent to parcels designated for training. Impacts to land use would therefore be negligible and long-term under Alternative 2 as a result of the long-term and potentially permanent transition from training to industrial use.

Alternative 3 – COA 2

Land use within COA 2 is currently designated as forest. Development would modify the parcel to industrial land use, for an overall reduction of 60.3 forested acres. No conflicts are anticipated to arise from Alternative 3 with the adjacent recreational parcel to the south and the housing parcels to the west. Impacts to land use would therefore be minor and long-term as a result of the long-term and likely permanent transition from forest to industrial use.

No Action Alternative

The No Action Alternative would not develop any of the proposed parcels for the Solar PV System, resulting in no change to land use. There would be no significant impact on land use in the area, land use designations, or the ability to use the land.

3.4.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Natural Gas Generator Units Alternative 1 would not result in any changes to the land use within the cantonment area. The existing industrial land use would be maintained. The surrounding land use would not interfere with the proposed projects, and the execution of this alternative would not conflict with adjacent industrial land use.

Alternative 2 – COA 4

Land use within the COA 4 parcel is currently designated for training operations. Under Natural Gas Generator Units Alternative 2, the land use would be changed from training to industrial. The 2-acre parcel is minimally developed for training use, therefore overall loss of training facilities and space would be minor. Impacts to land use would be minor and long-term as a result of the long-term and potentially permanent transition from training to industrial use.

No Action Alternative

The No Action Alternative would not develop any of the proposed parcels for the Natural Gas Generator Units, resulting in no change to land use. There would be no significant impact on land use in the area, land use designations, or the ability to use the land.

3.5 BIOLOGICAL RESOURCES

3.5.1 Affected Environment

3.5.1.1 Fish and Wildlife

The majority of fish and wildlife species found on Fort Jackson are typical of the Sand Hills region of South Carolina. Over the years, baseline and planning level surveys have been performed for various classifications of flora and fauna. There is a wide variety of wildlife, including more than 700 species of mammals, birds, fishes, invertebrates, reptiles, and amphibians that have been documented utilizing the diverse ecosystems. Several species of animals and plants documented on Fort Jackson are listed as at-risk, threatened, or endangered by the USFWS within the project area, as described below in **Section 3.5.1.3** (USFWS; list dated 19 July 2023) (IPaC, 2023).

Fish and wildlife management is addressed in the Integrated Natural Resources Management Plan (INRMP), which was prepared in accordance with the Sikes Act (Public Law 99-561), AR 200-3, Natural Resources – Land, Forest and Wildlife Management, and the Cooperative Plan Agreement among the Installation Commander, the USFWS, and the South Carolina Department of Natural Resources (SCDNR). Since military missions and resource management programs affect fish and wildlife habitat, their management activities focus upon programs designed to create and enhance habitat that are consistent with Installation's missions. Two primary goals for natural resources conservation are: (1) ensure no net loss in the capability of installation lands to support existing and projected military training and operations, and (2) use ecosystem management philosophies to protect, conserve, and enhance native flora and fauna with an emphasis on biodiversity enhancement.

Wildlife is affected mostly by forest management practices, particularly prescribed fire. Prescribed fire is one of the primary tools used in the management of the forested ecosystems and is detailed

in the INRMP. Other wildlife management practices include silvicultural practices, ongoing inventory and monitoring as well as creation and maintenance of wildlife openings, transition zones, and nesting structures. Hunting and fishing activities also play an important role in the management of certain wildlife populations. Hunting occurs during established hunting seasons and is regulated by Fort Jackson Regulation 28-4, Hunting and Fishing Regulation (Fort Jackson, 2018). Management of invasive species is also performed.

COA 1, TDC-1

Vegetation within COA 1 and TDC-1 includes pine and pine/upland hardwood forest types. These forest communities provide suitable habitat for generalist wildlife species (common species that can survive in a variety of different habitats [including residential and sometimes urban areas], such as squirrels, mice, raccoons, coyotes, deer, crows, and other similarly common species). .

COA 1, TDC-2

Vegetation within COA 1 and TDC-2 includes pine and pine/upland hardwood forest types. These forest communities provide suitable habitat for generalist wildlife species.

COA 2

Vegetation within COA 2 includes pine and pine/upland hardwood forest types. These forest communities provide suitable habitat for generalist wildlife species.

COA 3

At COA 3, there is no functional wildlife habitat (e.g., no habitats available to sustain a population or diversity of wildlife species), as the area is a former electrical substation.

Along the proposed pipeline, the maintained grassed areas and vegetation that would be disturbed provide very limited habitat for wildlife. In addition, the high levels of human activity, traffic, and noise in these areas are likely to cause many species of birds and other wildlife to avoid these areas.

COA 4

Vegetation within COA 4 includes pine and pine/upland hardwood forest types. These forest communities provide suitable habitat for generalist wildlife species.

Along the proposed pipeline, the maintained grassed areas and vegetation that would be disturbed provide very limited habitat for wildlife. In addition, the high levels of human activity, traffic, and noise in these areas are likely to cause many species of birds and other wildlife to avoid these areas.

3.5.1.2 Vegetation

Fort Jackson contains a wide variety of vegetative communities, ranging from xeric longleaf pine (*Pinus palustris*) and upland hardwood forests to vegetated and open water wetlands. Twelve vegetation cover types have been recognized for the purpose of cover type mapping, with at least 30 plant community types and 11 subtypes. The installation's landscape is naturally vegetated, except where development has cleared land in support of military missions. Over 720 flora species have been documented on Fort Jackson.

Fort Jackson can be classified generally into five primary terrestrial vegetative types: pine, pine/upland hardwood, upland hardwood, bottomland hardwood, and open field. Grassland areas on Fort Jackson include only a small amount in the cantonment area and alongside roads. Forest cover is the primary vegetative type at Fort Jackson.

Silvicultural practices, including prescribed burns, timber harvests, reforestation, and timber stand improvement, are also used to manage forest lands, with an emphasis on longleaf pine ecosystem restoration and maintenance.

COA 1, TDC-1

Vegetation within COA 1 includes the pine and pine/upland hardwood types. Species observed include a loblolly pine (*Pinus taeda*) overstory with a generally open understory, consisting of maintained grasses. Subcanopy and shrub layer species include saplings of overstory species, sweetgum (*Liquidambar styraciflua*), post oak (*Quercus stellata*), and water oak (*Quercus nigra*). Herbaceous species included broomsedge (*Andropogon virginicus*), lespedeza (*Lespedeza cuneata*), poison ivy (*Toxicodendron radicans*), and dogfennel (*Eupatorium capillifolium*). Scattered throughout COA 1 are TDC stations/obstacles.

Vegetation within TDC-1 is similar to that of COA 1 and consists of a large loblolly pine overstory with a generally open understory, consisting of maintained grasses. The northeastern wetland area of TDC-1 consists of sweetgum, red maple (*Acer rubrum*), tulip poplar (*Liriodendron tulipifera*), and southern magnolia (*Magnolia grandiflora*). Netted chain fern (*Woodwardia areolata*) was also prominent in the wetland area.

COA 1, TDC-2

Vegetation for COA 1 is described above. Vegetation within TDC-2 is similar to that within TDC-1 and consists of a large loblolly pine overstory with a generally open understory, consisting of maintained grasses. TDC-2 is bisected by Dixie Road.

COA 2

Vegetation within COA 2 includes the pine and pine/upland hardwood types. Species observed include an overstory of loblolly pine, sweetgum, and water oak. Subcanopy and shrub layer species include saplings of overstory species, sassafras (*Sassafras albidum*), black cherry (*Prunus serotina*), pignut hickory (*Carya glabra*), winged sumac (*Rhus copallina*), and persimmon (*Diospyros virginiana*). Herbaceous species include broomsedge, bracken fern (*Pteridium aquilinum*), blackberry (*Rubus* sp.), poison ivy, muscadine (*Vitis rotundifolia*), and dogfennel.

COA 3

Vegetation within COA 3 is mostly maintained grasses, as the area is the site of an existing substation. Other observed vegetation around the substation included poison ivy, Chinese privet (*Ligustrum sinense*), Virginia creeper (*Parthenocissus quinquefoli*a), and dogfennel. A few loblolly pines are located adjacent to the northeastern side of COA 3. The proposed natural gas pipeline follows the Lee Road, Anderson Street, and Marion Avenue right-of-ways. Vegetation along these roads consists of maintained lawns/grassed areas, ornamental trees and shrubs, and other vegetation as described for the COAs, above.

COA 4

Vegetation in COA 4 is the same as COA 1, with which it shares its eastern boundary. The proposed natural gas pipeline follows the Forrest Road and Jackson Boulevard right-of-ways. Vegetation along these roads consists of maintained lawns/grassed areas, ornamental trees and shrubs, and other vegetation as described for the COAs, above.

3.5.1.3 Threatened, Endangered, and Protected Species

Under Section 7 of the Endangered Species Act (ESA), the Army must ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any threatened and endangered species or result in the destruction or adverse modification of habitats. No land on Fort Jackson has been identified as critical habitat for any Federally-listed endangered or threatened species.

Flora

Four Federally-listed plant species have been located on Fort Jackson. The endangered Rough-leafed loosestrife (*Lysimachia asperulaefolia*) and the threatened Smooth coneflower (*Echinacea laevigata*) were identified during a threatened and endangered plant survey conducted in 1992. Purple balduina (*Balduina atropurpurea*) and Bog spicebush (*Lindera subcoriacea*), at-risk species, have also been found on Fort Jackson.

Rough-leaved Loosestrife is an herbaceous, perennial, rhizomatous member of the Primulaceae (Loosestrife family). The Fort Jackson population, which represents the single, extant South Carolina occurrence, is found on the eastern edge of the East Impact Area, along with purple balduina. Smooth Coneflower is a rhizomatous perennial which blooms with a pale purple or pink flower from late May through July. Fort Jackson provides habitat for two populations of Smooth Coneflower near Statue of Liberty Road and on Lundy's Lane on the eastern end of the installation. Given the presence of these Federally-listed species, Endangered Species Management Components (ESMCs) have been prepared. The objective of the ESMC for the *Flora Endangered Species Management Component of the INRMP for Smooth Coneflower and Rough-leaved Loosestrife United States Army Training Center and Fort Jackson* (Fort Jackson, 2015) is to conserve these endangered plant species as required by the ESA, while providing for training readiness and other mission requirements.

In addition to these species, Canby's dropwort (*Oxypolis canbyi*) is listed in the USFWS Information for Planning and Consultation (IPaC) report for the project areas (IPaC, 2023), but the species has not been found within Fort Jackson to date. IPaC is a tool provided by USFWS that provides a list of protected species and critical habitats for a specific project area. In South Carolina, the species inhabits a variety of wetland or savannah coastal plain communities, such as cypress or pine savannahs, wet sloughs, or edges of cypress ponds. The species is not anticipated to occur within the project area.

Fauna

Fort Jackson provides habitat for one resident Federally-listed endangered animal species, the RCW (*Dryobates borealis*). RCW is a non-migratory bird that is endemic to the pine forests of the southeastern United States. It is found in association with longleaf pine forests, although it can be found in other pine habitats, including loblolly, shortleaf, slash, and others. There are 69 active RCW clusters on Fort Jackson.

The RCW population and associated habitat is managed in accordance with the RCW ESMC (Fort Jackson, 2013) and *Management Guidelines for the Red-cockaded Woodpecker on Army Installations* (Army, 2007). The cantonment area has been excluded as a defined RCW Habitat Management Unit (i.e., an area to be managed for RCW use).

The tricolored bat was added as a proposed endangered species for the project area by USFWS in September 2022. The range of the tricolored bat covers much of the southeast and known and potentially suitable habitat is present within Fort Jackson. Suitable summer roosting habitat for the tricolored bat includes dead or live tree foliage, caves, mines, rock crevices, bridges, and culverts. Suitable winter habitat includes caves, mines, or cave-like tunnels. Additionally, this species typically roosts along riparian corridors.

Fort Jackson also provides suitable habitat for the monarch butterfly (*Danaus plexippus*), a federal candidate species. Potentially suitable monarch butterfly habitat occurs statewide and may be present within the project areas. Based on the scope of the actions compared to the range and distribution of this species, the actions, as proposed, are not likely to jeopardize the continued existence of the monarch butterfly and would be completed before a final listing decision.

The American bald eagle (*Haliaeetus leuocephalus*) is no longer listed as endangered but is protected under the Bald and Golden Eagle Protection Act. One active nest is known to exist near Dupre Pond, over five miles for the project locations described in this EA.

The American wood stork (*Mycteria americana*) has been documented foraging on the installation, but no long-term occupation or nesting has been observed.

Although not currently listed as threatened or endangered, Fort Jackson provides habitat for one at risk animal species, Chamberlain's dwarf salamander (*Eurycea chamberlaini*).

COA 1, TDC-1

Vegetation within COA 1 and TDC-1 includes pine and pine/upland hardwood forest types. This habitat is suitable for the tricolored bat and RCW. However, Fort Jackson RCW clusters are well documented, and the closest active RCW clusters are over three miles away. No other protected species are known or expected to occur within the COA 1 or TDC-1 footprint.

COA 1, TDC-2

Vegetation within COA 1 and TDC-2 includes pine and pine/upland hardwood forest types. This habitat is suitable for the tricolored bat and RCW. However, Fort Jackson RCW clusters are well documented, and the closest active RCW clusters are over three miles away. No other protected species are known or expected to occur within the COA 1 or TDC-2 footprint.

COA 2

Vegetation within COA 2 includes pine and pine/upland hardwood forest types. This habitat is suitable for the tricolored bat and RCW. However, Fort Jackson RCW clusters are well documented, and the closest active RCW clusters are over three miles away. No other protected species are known or expected to occur within the COA 2 footprint.

COA 3

At COA 3, there is no functional wildlife habitat (e.g., no habitats available to sustain a population or diversity of wildlife species), as the area is a former electrical substation.

Along the proposed pipeline, the maintained grassed areas and vegetation that would be disturbed provide very limited habitat for wildlife. In addition, the high levels of human activity, traffic, and noise in these areas are likely to cause many species of birds and other wildlife to avoid these areas. Trees along the right-of-way could provide marginal summer roosting habitat for tricolored bat.

COA 4

Vegetation within COA 4 includes pine and pine/upland hardwood forest types. This habitat is suitable for the tricolored bat and RCW. However, Fort Jackson RCW clusters are well documented, and the closest active RCW clusters are over three miles away. No other protected species are known or expected to occur within the COA 4 footprint.

Along the proposed pipeline, the maintained grassed areas and vegetation that would be disturbed provide very limited habitat for wildlife. In addition, the high levels of human activity, traffic, and noise in these areas are likely to cause many species of birds and other wildlife to avoid these areas. Trees along the right-of-way could provide marginal summer roosting habitat for tricolored bat.

3.5.2 Environmental Consequences

3.5.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Fish and Wildlife

Alternative 1 would require the clearing of approximately 55 acres of forest vegetation to construct the Solar PV system and relocate the TDC course. Construction would result in short-term negligible impacts to wildlife. During construction, any wildlife in the area likely would leave, but would be expected to relocate to adjacent forested areas. After construction, the permanent conversion of forested habitat to the Solar PV system and relocated TDC course would result in negligible, long term impacts to fish and wildlife. Forested areas adjacent to and nearby the proposed development would continue to be available for wildlife habitat (Fort Jackson has hundreds of other pine-dominated forest stands covering more than 12,000 acres within Fort Jackson according to the INRMP).

While common species of wildlife may be disturbed or displaced during the construction phase, full implementation of projects, including appropriate BMPs, would not impact contiguous forested areas used by interior dwelling wildlife species. All projects would be implemented in compliance with the INRMP, which would ensure impacts to fish and wildlife would be minimal.

Vegetation

Alternative 1 would require the clearing of approximately 55 acres of forest vegetation to construct the Solar PV system and relocate the TDC course. Impacts to vegetation would be minimized by only removing necessary trees and implementing construction BMPs. Areas would be permanently re-vegetated as quickly as possible upon completion of construction activities to assist with limiting soil erosion and sediment transport to surface waters. Vegetation removal would result in a long-term minor adverse impact to vegetation communities. Existing vegetation

of similar quality around COA 1 and TDC-1 (over 12,000 acres of pine-dominated stands within Fort Jackson) would remain.

There would be no significant impacts to native or landscape vegetation from the operation of the solar facilities because no actions affecting vegetation would occur after initial installation of the solar facilities.

Threatened and Endangered Species

The proposed project would have no effect on the RCW, American bald eagle, wood stork, or protected plants, as those species do not have suitable habitat and/or are not known to occur within the project area. A "no effect" determination under ESA Section 7 is recommended for these species as indicated below:

- RCW – "No effect", the species is monitored at Fort Jackson; RCW does not occur in the project area and the project area is not a RCW Habitat Management Unit.
- American bald eagle - "No effect", the species is monitored at Fort Jackson; bald eagles are not found in the project area and suitable foraging or nesting habitat is not present within the project area for the bald eagle.
- American wood stork - "No effect", suitable habitat is not present within the project area. The species is not known to nest or frequently occupy habitats at Fort Jackson, with historical documentations limited to transient individuals. The wood stork is not anticipated to occur in the project area.
- Rough-leafed loosestrife - "No effect", the species is monitored and managed at Fort Jackson under an ESMC. The species is not found in the project area and suitable habitat is not present within the project area.
- Smooth coneflower - "No effect", the species is monitored and managed at Fort Jackson under an ESMC. The species is not found in the project area and suitable habitat is not present within the project area.
- Canby's dropwort - "No effect", suitable habitat is not present within the project area. In addition, the species is not known to occur within the installation, as previous flora surveys at Fort Jackson have not identified the species.

Tree-clearing activities have the potential to affect the tricolored bat. Currently, Fort Jackson conferences with USFWS for tricolored bat impacts, but once the bat is officially listed later in 2023, either formal or informal consultation will be required with USFWS. To minimize impacts to the species, vegetation clearing is limited to between the dates of September 1-December 14 and February 14-March 31. Additionally, no construction is to be conducted at night, and lighting restrictions during overnight hours are required. With the appropriate construction mitigation measures, it would be expected that this alternative "May Affect, Not Likely to Adversely Affect" the tricolored bat. If required by USFWS, Fort Jackson will prepare a biological assessment for the tricolored bat. This alternative would have long term negligible adverse impacts to protected species based on potential impacts to tricolored bat.

Alternative 2 – COA 1, TDC-2

Fish and Wildlife

Alternative 2 would require the clearing of approximately 41 acres of forest vegetation to construct the Solar PV system and relocate the TDC course. Impacts are expected to be similar to Alternative 1 (construction would result in short-term and long-term negligible impacts to wildlife). During construction, any wildlife in the area likely would leave, but would be expected to relocate to adjacent forested areas. After construction, forested areas adjacent to and nearby the proposed development (over 12,000 similar acres of pine-dominated stands within Fort Jackson) would continue to be available for wildlife habitat.

Vegetation

Alternative 2 would require the clearing of approximately 41 acres of forest vegetation to construct the Solar PV system and relocate the TDC course. Impacts are the same as those for Alternative 1 (long term minor adverse impact to vegetation communities). After construction, forested areas adjacent to and nearby the proposed development (over 12,000 similar acres of pine-dominated stands within Fort Jackson) would remain.

There would be no significant impacts to native or landscape vegetation from the operation of the solar facilities because no actions affecting vegetation would occur after initial installation of the solar facilities.

Threatened and Endangered Species

This alternative would be expected to have the same impacts as Alternative 1. Alternative 2 would have “no effect” on the RCW, American bald eagle, wood stork, or protected plants, as those species do not have suitable habitat and/or are not known to occur within the project area. With the appropriate construction mitigation measures, it would be expected that this alternative “May Affect, Not Likely to Adversely Affect” the tricolored bat. If required by USFWS, Fort Jackson will prepare a biological assessment for the tricolored bat. This alternative would have long-term negligible adverse impacts to protected species based on potential impacts to tricolored bat.

Alternative 3 – COA 2

Fish and Wildlife

Alternative 3 would require the clearing of approximately 60.3 acres of forest vegetation to construct the Solar PV system. Impacts are expected to be similar to Alternative 1 (construction would result in short-term and long-term negligible impacts to wildlife). During construction, any wildlife in the area likely would leave, but would be expected to relocate to adjacent forested areas. After construction, forested areas adjacent to and nearby the proposed development (over 12,000 similar acres of pine-dominated stands within Fort Jackson) would continue to be available for wildlife habitat.

Vegetation

Alternative 3 would require the clearing of approximately 60.3 acres of forest vegetation to construct the Solar PV system. Impacts to vegetation would be minimized by only removing necessary trees and implementing construction BMPs. Areas would be permanently re-vegetated as quickly as possible upon completion of construction activities to assist with limiting soil erosion and sediment transport to surface waters. Vegetation removal would result in a long-term minor adverse impact to vegetation communities. Existing vegetation of similar quality around COA 2

would remain. Forested areas adjacent to and nearby the proposed development (over 12,000 similar acres of pine-dominated stands within Fort Jackson) would remain.

There would be no significant impacts to native or landscape vegetation from the operation of the solar facilities, because no actions affecting vegetation would occur after initial installation of the solar facilities.

Threatened and Endangered Species

This alternative would be expected to have the same impacts as Alternative 1. Alternative 3 would have "no effect" on the RCW, American bald eagle, wood stork, or protected plants, as those species do not have suitable habitat and/or are not known to occur within the project area. With the appropriate construction mitigation measures, it would be expected that this alternative "May Affect, Not Likely to Adversely Affect" the tricolored bat. If required by USFWS, Fort Jackson will prepare a biological assessment for the tricolored bat. This alternative would have long term negligible adverse impacts to protected species based on potential impacts to tricolored bat.

No Action Alternative

Implementation of the No-Action Alternative would cause neither significant positive nor significant adverse effects on wildlife, plants, or protected species within Fort Jackson because the Solar PV facilities would not be developed. The vegetation and wildlife habitat would remain unchanged.

3.5.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Fish and Wildlife

At COA 3, there is no functional wildlife habitat (e.g., no habitats available to sustain a population or diversity of wildlife species), as the area is a former electrical substation. Construction and operation of the Natural Gas Generator Units would not impact wildlife.

Along the proposed pipeline, the maintained grassed areas and vegetation that would be disturbed provide very limited habitat for wildlife. In addition, the high levels of human activity, traffic, and noise in these areas are likely to cause many species of birds and other wildlife to avoid these areas. A limited number of ornamental and/or native trees and shrubs could be removed for the pipeline. Only a small area of low-quality habitat utilized by a relatively few, common species of wildlife would be lost due to potential removal of selected trees and shrubs. There would be negligible impacts to wildlife or wildlife habitat associated with the pipeline installation because of the current industrial land use and urban environmental setting.

Vegetation

At COA 3, little to no vegetation clearing would be required as the project area is located at the location of an existing substation. Impacts to vegetation would be minimized by only removing necessary trees and implementing construction BMPs. Areas would be permanently re-vegetated as quickly as possible upon completion of construction activities to assist with limiting soil erosion and sediment transport to surface waters. Vegetation removal would result in a long-term negligible adverse impact to vegetation communities.

Along the proposed pipeline, the proposed construction would be planned so as to disturb the minimum area necessary and would largely occur within existing disturbed/developed areas. Reasonable efforts would be made to avoid or minimize construction activities occurring within the drip line of trees or in close proximity to other important features of the natural landscape or landscaped environment. Where complete avoidance would not be practicable, limited clearing of trees, shrubs, and other vegetation may be required. In such instances, the construction contractor would coordinate with Fort Jackson to determine appropriate measures to be used, and impacts would be insignificant. Vegetation removal along the pipeline corridor would result in a long-term negligible adverse impact to vegetation communities.

There would be no significant impacts to native or landscape vegetation from the operation of the Natural Gas Generator Units, because no actions affecting vegetation would occur after initial installation of the facility.

Threatened and Endangered Species

The proposed project would have no effect on the RCW, American bald eagle, wood stork, or protected plants, as those species do not have suitable habitat and/or are not known to occur within the project area. A “no effect” determination under ESA Section 7 is recommended for these species as indicated below:

- RCW – “No effect”, the species is monitored at Fort Jackson; RCW does not occur in the project area and the project area is not a RCW Habitat Management Unit.
- American bald eagle - “No effect”, the species is monitored at Fort Jackson; bald eagles are not found in the project area and suitable foraging or nesting habitat is not present within the project area for the bald eagle.
- American wood stork - “No effect”, suitable habitat is not present within the project area. The species is not known to nest or frequently occupy habitats at Fort Jackson, with historic documentations limited to transient individuals. The wood stork is not anticipated to occur in the project area.
- Rough-leafed loosestrife - “No effect”, the species is monitored and managed at Fort Jackson under an ESMC. The species is not found in the project area and suitable habitat is not present within the project area.
- Smooth coneflower - “No effect”, the species is monitored and managed at Fort Jackson under an ESMC. The species is not found in the project area and suitable habitat is not present within the project area.
- Canby’s dropwort - “No effect”, suitable habitat is not present within the project area. In addition, the species is not known to occur within the installation, as previous flora surveys at Fort Jackson have not identified the species.

Tree-clearing activities along the proposed pipeline corridor have the potential to affect the tricolored bat. Currently, Fort Jackson conferences with USFWS for tricolored bat impacts, but once the bat is officially listed later in 2023, either formal or informal consultation will be required with USFWS. To minimize impacts to the species, vegetation clearing is limited to between the dates of September 1-December 14 and February 14-March 31. Additionally, no construction is to be conducted at night, and lighting restrictions during overnight hours are required. With the appropriate construction mitigation measures, it would be expected that this alternative “May Affect, Not Likely to Adversely Affect” the tricolored bat. If required by USFWS, Fort Jackson will

prepare a biological assessment for the tricolored bat. This alternative would have long term negligible adverse impacts to protected species based on potential impacts to tricolored bat.

Alternative 2 – COA 4

Fish and Wildlife

Alternative 2 would require the clearing of approximately 2.1 acres of forest vegetation to construct the Natural Gas Generator System. Construction would result in short-term negligible impacts to wildlife. During construction, any wildlife in the area likely would leave, but would be expected to relocate to adjacent forested areas. After construction, the permanent conversion of forested habitat for the natural gas generation system would result in negligible, long term impacts to fish and wildlife. Forested areas adjacent to and nearby the proposed development (over 12,000 similar acres of pine-dominated stands within Fort Jackson) would continue to be available for wildlife habitat.

While common species of wildlife may be disturbed or displaced during the COA 4 construction phase, full implementation of projects, including appropriate BMPs, would not impact contiguous forested areas used by interior dwelling wildlife species. All projects would be implemented in compliance with the INRMP, which would ensure impacts to fish and wildlife would be minimal.

Along the proposed pipeline, the maintained grassed areas and vegetation that would be disturbed provide very limited habitat for wildlife. In addition, the high levels of human activity, traffic, and noise in these areas are likely to cause many species of birds and other wildlife to avoid these areas. A limited number of ornamental and/or native trees and shrubs could be removed for the pipeline. Only a small area of low-quality habitat utilized by a relatively few, common species of wildlife would be lost due to potential removal of selected trees and shrubs. There would be negligible impacts to wildlife or wildlife habitat associated with the pipeline installation because of the current industrial land use and urban environmental setting.

Vegetation

Alternative 2 would require the clearing of approximately 2.1 acres of forest vegetation to construct the natural gas generator facility. Impacts to vegetation would be minimized by only removing necessary trees and implementing construction BMPs. Areas would be permanently re-vegetated as quickly as possible upon completion of construction activities to assist with limiting soil erosion and sediment transport to surface waters. Vegetation removal would result in a long term minor adverse impact to vegetation communities. Existing vegetation of similar quality around COA 4 (over 12,000 similar acres of pine-dominated stands within Fort Jackson) would remain.

Along the proposed pipeline, the proposed construction would be planned so as to disturb the minimum area necessary and would largely occur within existing disturbed/developed areas. Reasonable efforts would be made to avoid or minimize construction activities occurring within the drip line of trees or in close proximity to other important features of the natural landscape or landscaped environment. Where complete avoidance would not be practicable, minor clearing of trees, shrubs, and other vegetation may be required. In such instances, the construction contractor would coordinate with Fort Jackson to determine appropriate measures to be used, and impacts would be insignificant.

There would be no significant impacts to native or landscape vegetation from the operation of the Natural Gas Generator Units, because no actions affecting vegetation would occur after initial installation of the facility.

Threatened and Endangered Species

This alternative would be expected to have the same impacts as Alternative 1. Alternative 2 would have "no effect" on the RCW, American bald eagle, wood stork, or protected plants, as those species do not have suitable habitat and/or are not known to occur within the project area. With the appropriate construction mitigation measures, it would be expected that this alternative "May Affect, Not Likely to Adversely Affect" the tricolored bat. If required by USFWS, Fort Jackson will prepare a biological assessment for the tricolored bat. This alternative would have long-term negligible adverse impacts to protected species based on potential impacts to tricolored bat.

No Action Alternative

Implementation of the No-Action Alternative would cause neither significant positive nor significant adverse effects on wildlife, plants, or protected species within Fort Jackson because the Natural Gas Generator facilities would not be developed. The vegetation and wildlife habitat would remain unchanged.

3.6 CULTURAL RESOURCES

The Army is required to comply with Sections 106 and 110 of the NHPA (regarding historic properties) and the implementing regulations for Section 106 under 36 CFR 800. Compliance is also required for preservation of the following:

- Cultural items, as defined in the Native American Graves Protection and Repatriation Act (NAGPRA)
- Archaeological resources, as defined in the Archaeological Resources Protection Act of 1979
- Sacred sites, as defined in EO 13007, *Indian Sacred Sites*, to which access is provided under the American Indian Religious Freedom Act (AIRFA)
- Collections, as defined in 36 CFR 79, *Curation of Federally-Owned and Administered Collections*

The Fort Jackson ICRMP outlines the policies, procedures, and responsibilities for meeting cultural resources compliance and preservation requirements. The ICRMP is a component of the Installation's Real Property Master Plan (RPMP) and incurs minor revisions annually and major revisions, if necessary, every five years.

3.6.1 Affected Environment

Fort Jackson's primary cultural resources are archaeological sites, historic buildings, and cemeteries. Within its boundaries, there are no identified access routes to or sites of religious or ceremonial rites of the Native Americans, no properties listed on the NRHP, no properties listed on the World Heritage List, and no properties designated as a National Historic Landmark. Buildings 1895, 2335, 2495, and 4500 are eligible for listing on the NRHP. Archaeological site locations are not a matter of public record.

A Programmatic Agreement (PA) between Fort Jackson, the SHPO, and the Advisory Council on Historic Preservation was reviewed in 2015. The PA provides stipulations by which Fort Jackson can establish a program of operation, maintenance, and development that is in compliance with the Army's Section 106 responsibilities. The PA identifies projects and activities that are exempt from review, as well as those that can receive an internal review.

3.6.1.1 Archaeological Resources

Archaeological surveys have been completed in all areas where surveying is permitted by the South Carolina Institute of Archaeology and Anthropology (SCIAA), (SCIAA, 2018). Follow-up studies are conducted on a case-by-case basis. Locations of all archaeological sites are contained within a Geographic Information System (GIS) database maintained by Fort Jackson. Details of these sites, including individual reports, are on file at Fort Jackson and the SCIAA State Site Files. Monitoring of sites eligible for listing on the NRHP is conducted annually or more frequently as needed.

A total of 717 archaeological sites have been discovered at Fort Jackson. A total of 647 sites have been determined to be ineligible (Fort Jackson ICRMP, 2018). There are currently 72 National Register eligible, signed, and protected archaeological properties. There are 10 sites that have been identified and exempt from further evaluation as they are located in the dudded impact areas.

COA 1, TDC-1

There are no known NRHP-eligible archaeological resources located within or near the COA 1 footprint. There are no known NRHP-eligible archaeological resources within or near the TDC-1 footprint, but three non-NRHP-eligible sites have been investigated near TDC-1 (Sites 38RD0656, 38RD0924, and 38RD0922).

COA 1, TDC-2

There are no known NRHP-eligible archaeological resources located within or near the COA 1 footprint. There are no known NRHP-eligible archaeological resources within or near the TDC-2 footprint, but two non-NRHP-eligible sites have been investigated within TDC-2 on the southeast side of Dixie Road (Sites 38RD0538 and 38RD0543). A third non-NRHP-eligible site is located just to the east of TDC-2 (Site 38RD0542).

COA 2

COA 2 contains an archaeological site associated with the military history of Fort Jackson. The site is currently being investigated by Fort Jackson. Because the investigation is ongoing, site specifics are considered sensitive and are not currently available for public review. The site has been determined to be eligible for inclusion on the NRHP by South Carolina SHPO. The approximate site limits include 26.3 acres within the central portion of COA 2. There are no other known NRHP-eligible archaeological resources located within the COA 2 footprint. A non-NRHP-eligible site is located to the northeast of COA 2 on the east side of Ivy Road (Site 38RD0551).

COA 3

There are no known NRHP-eligible archaeological resources located within or near the COA 3 footprint or along the proposed COA 3 pipeline. COA 3 was previously disturbed as a part of the

substation construction located within COA 3. Most of the proposed COA 3 pipeline corridor has been previously disturbed by road construction, ditching, and below-ground infrastructure along the road right-of-way. A non-NRHP-eligible site has been investigated along the proposed COA 3 pipeline corridor along Lee Road at the 81st RSC Motor Pool parking area (Site 38RD1019).

COA 4

There are no known NRHP-eligible archaeological resources located within or near the COA 4 footprint or along the proposed COA 4 pipeline. Most of the proposed COA 4 pipeline corridor has been previously disturbed by road construction, ditching, and below-ground infrastructure along the road right-of-way.

3.6.1.2 Architectural Resources

To date, Fort Jackson has identified six structures eligible for listing on the NRHP. Of these, three structures (Buildings 1520, 2495, and 2511) have completed Historic American Building Survey/Historic American Engineering Record documentation as mitigation associated with their demolition, and two (Buildings 1520 and 2511) were demolished. The remaining mitigated structure, Building 2495, is a Directorate of Family and Morale, Welfare and Recreation general maintenance facility. The other eligible buildings are Building 1895 (120th Adjutant General [AG] Battalion Headquarters), Building 2335 (Anderson Street Chapel), and Building 4500 (Moncrief Army Health Clinic). These three were determined eligible in 2022. Building 1895 will be demolished in the near future for the construction of a new 120th Adjutant Battalion Headquarters and Reception Complex. A Section 106 agreement document and associated mitigation actions or products are being developed to address the adverse effect. Building 1895 is scheduled for demolition, therefore impacts to the historic character of the building will not be analyzed in this EA.

Building 2335 is located at the intersection of Jackson Boulevard and Anderson Street Chapel. The nearest project location is the proposed COA 4 Pipeline, located approximately 65 feet east of Building 2325.

Building 2495 is located at the intersection of Marion Avenue and Cleburne Street. The nearest project location is the proposed COA 4 pipeline, which would be over 1,000 feet west of Building 2495. Building 4500 is located at the intersection of Hill Street and Stuart Street. The nearest project locations are COA 3 and the COA 4 pipeline, located approximately 975 feet southeast and 1,220 feet northwest of Building 4500, respectively. None of the proposed projects are located close enough to Building 2495 or 4500 to affect this resource.

No historic architectural resources within Fort Jackson's boundaries have been identified within 10 miles of any of the Proposed COA/TDC developments (Archsite, 2023).

3.6.1.3 Cemeteries

The ICRMP defines historic cemeteries as burial grounds, usually marked by headstones and/or fenced areas, associated with families, churches, or communities that were established within Fort Jackson between European settlement and acquisition by the Army. The definition does not include the unknown, unrecorded, and unmarked human burials that may be within the

boundaries of Fort Jackson. There are 27 recorded cemeteries on the installation, and these are monitored annually or as needed. There are no cemeteries within or adjacent to the project areas.

The ICRMP states that none of the cemeteries are considered eligible for NRHP inclusion but all should be protected (SCIAA, 2018). For management purposes, all cemeteries are treated in the same manner as NRHP eligible cultural resources. They are to be preserved in place.

In addition to architectural and cultural resource data on file with Fort Jackson, the ArchSite Subscriber GIS maintained by the SCIAA, and the South Carolina Department of Archives and History (SCDAH) was also consulted (ArchSite, 2023). One historical cemetery has been identified approximately 2.5 miles southeast of COA 2, the closest Proposed Action property to the resource. This cemetery is the closest and only archaeological resource identified by ArchSite within Fort Jackson's boundaries.

3.6.2 Environmental Consequences

Cultural resources may be directly or indirectly impacted or affected by physically changing, damaging, or ruining all or part of the resource, changing attributes of the resource's surroundings that contribute to the resource, modifying the character of the resource through visual or audible means, or neglecting the resource. Fort Jackson would continue to comply with the ICRMP and the PA and would continue to consult, as needed, for any effects regardless of the alternative selected. Previously disturbed areas within the cantonment area do not require an archaeological survey (Cantonment Area, Fort Jackson, SC, Letter from the State Historic Preservation Office, Dec. 15, 1993).

If there are inadvertent discoveries of cultural items, including traditional cultural properties, human remains, or archaeological resources during the course of this Proposed Action, project personnel are directed to avoid the site of discovery and immediately contact the Fort Jackson Environmental Division. All work in the area of discovery must stop until it can be investigated. The resource would then be recorded and evaluated, and the impacts mitigated as necessary.

The Native American Graves Protection and Repatriation Act of 1990 establishes rights of federally recognized Indian groups to claim ownership of certain cultural items, including human remains. Should human remains be discovered during excavation activities, project personnel would be directed to immediately stop activity at and near the discovery location, contact the Fort Jackson Environmental Division, protect the location by establishing a buffer zone, and await further instructions.

3.6.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

COA 1 has been previously disturbed from training activity developments. Previously disturbed areas within the cantonment area do not require an archaeological survey, and no known NRHP-eligible resources are within or near COA 1. TDC-1 is located outside the cantonment area, but no NRHP-eligible historical or archaeological resources have been identified in the area of TDC-1.

Building 2335 and 4500 are located 1.9 miles and 4700 feet south of COA 1, respectively. Building 2495 is located 1.5 miles from COA 1, the nearest property to be developed under Alternative 1.

Fort Jackson previously mitigated this facility pursuant to Section 106 of the NHPA. No significant impacts to architectural resources are expected. This alternative would have no effect on archaeological or historic resources listed or eligible for listing on the NRHP.

Alternative 2 – COA 1, TDC-2

Impacts to architectural resources would be the same as described in Alternative 1.

TDC-2 is located outside the cantonment area. Resource surveys identified two archaeological sites within or intersecting the boundaries of TDC-2. Both features are ineligible for listing on the NRHP. This alternative would have no effect on archaeological or historic resources listed or eligible for listing on the NRHP.

Alternative 3 – COA 2

Building 2335 and 4500 are located 2.0 and 1.6 miles west of COA 2, respectively. Building 2495 is located 1.6 miles from COA 2. No significant impacts to architectural resources are expected.

An NRHP-eligible archaeological site related to the military history of Fort Jackson is located within the COA 2 boundaries. The approximate site limits include 26.3 acres within the central portion of COA 2. If selected for implementation, the site would require additional coordination with South Carolina SHPO, site investigations and significant mitigation (potentially including additional archaeological investigations and recovery). This alternative is likely to have moderate to major impacts to the NRHP-eligible resource, which could be reduced by significant mitigation to document the resource.

No Action Alternative

The No Action Alternative would not affect NRHP-eligible properties or other cultural resources.

3.6.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Building 2335 and 4500 are located approximately 1.1 miles and 975 feet from COA 3, respectively. Building 2335 is located 965 feet north of the COA 3 pipeline along Marion Avenue. Building 2495 is located 3,500 feet from COA 3, and 2,200 feet from the COA 3 pipeline. No significant impacts to architectural resources are expected.

There are no known NRHP-eligible resources within COA 3 or along the COA 3 pipeline. This alternative would have no effect on archaeological or historic resources listed or eligible for listing on the NRHP.

Alternative 2 – COA 4

Building 2335 is located 65 feet west of the COA 4 pipeline. Development of the pipeline is not expected to impact the viewshed of Building 2335, as all installations would be subsurface. Developments would not impact the integrity of Building 2335, as construction would take place within the immediate vicinity of the roadway. All other Proposed Action components are located at least 1,200 feet from the building. Building 4500 is located approximately 1 mile south of COA 4 and 1,220 feet southeast of the COA 4 pipeline. Building 2495 is located over 1.5 miles from COA 4, and 1,200 feet from the COA 4 pipeline. No significant impacts to architectural resources are expected.

There are no known NRHP-eligible resources within COA 4 or along the COA 4 pipeline. This alternative would have no effect on archaeological or historic resources listed or eligible for listing on the NRHP.

No Action Alternative

The No Action Alternative would not affect NRHP-eligible properties or other cultural resources.

3.7 HAZARDOUS MATERIALS AND WASTE

3.7.1 Affected Environment

For purposes of this EA, hazardous materials are those regulated under federal, state, Department of Defense, and Army regulations. Hazardous materials are required to be handled, managed, treated, or stored properly by trained personnel under the following regulations: USEPA, 40 CFR 260 et seq; OSHA Hazardous Communication, 29 CFR 1900.1200 and 29 CFR 1926.59; and Department of Transportation Hazardous Materials, 49 CFR 172.101.

The Installation if required to annually track the amount of hazardous substances generated, stored, and disposed on the Installation and report to regulatory agencies. Fort Jackson no longer has a permitted on-installation Hazardous Waste storage facility; however, the Fort Jackson Environmental Division operates a hazardous waste storage facility used to store waste for up to 90 days until disposal. Fort Jackson is a large quantity generator of hazardous waste and operates under permit number SC 3210020449, which was renewed on October 14, 2020. Facility inspections are conducted each year by SCDHEC and every four to five years by the USEPA.

Military operations have been on-going at Fort Jackson for over 90 years. During that time the industrial operations have grown in support of the training programs. Former industrial activities generated wastes, which were stored, treated or disposed of at the installation according to standard practices at that time. As a result, there are multiple contaminated soil and/or groundwater sites on Fort Jackson.

3.7.1.1 Hazardous Waste

Hazardous wastes generated from site operations are stored and handled according SCDHEC hazardous waste regulations. Hazardous waste at Fort Jackson is primarily generated by base operations including maintenance, transportation, and training activities. In the latest Biennial Waste Report to USEPA detailing generation volumes in 2022, Fort Jackson reported generating 0.66 tons of waste of hazardous waste (USEPA, 2023c).

Toxic materials (Asbestos-containing materials (ACM), lead-based paint (LBP), polychlorinated biphenyls (PCBs), etc.) are regulated under the Toxic Substance Control Act, as promulgated by the USEPA. All identified and potential ACM, LBP, and PCB-containing materials at Fort Jackson are addressed and managed in accordance with applicable state and federal regulations. Construction and demolition activities in older buildings and infrastructure could result in the generation of toxic wastes (including asbestos and LBP). These toxic wastes would be removed, managed, and disposed of prior to and/or during the demolition in accordance with their respective management plans. The presence of any on-site toxic materials would be addressed as part of construction and demolition efforts. Applicable asbestos worker protection measures and

adherence to National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations would ensure proper handing and safety requirements are met.

Guidance and procedures for the management of PCBs is contained in AR 200-1 and FJ 200-8. Most PCB containing transformers on Fort Jackson have been replaced with non-PCB transformers. PCB containing waste will be handled and disposed of in accordance with all applicable Federal, state and local regulations.

3.7.1.2 Installation Restoration Program (IRP)

Fort Jackson is required to comply with applicable Federal, state, local, and DoD requirements for the clean-up of contamination on Defense Environmental Restoration Program (DERP) and non-DERP eligible sites (including the IRP, MMRP, Compliance Clean-up Program, and Operational Range Assessment Program [ORAP] sites). All program sites at Fort Jackson are primarily regulated under the RCRA or, to a lesser extent, the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

These programs are established under the DERP to identify, investigate, and clean up hazardous substances, pollutants, contaminants, UXO discarded military munitions, and munitions constituent (MC) contaminants that pose environmental health and safety risks at active military installations and formerly used defense sites (FUDS). Fort Jackson currently has approximately 32 active sites, generally referred to as an AOC or Solid Waste Management Unit (SWMU).

Training, range clearance, and emergency munition operations are exempt from RCRA regulations, as documented in a negotiated agreement between Fort Jackson, SCDHEC, and the USEPA. This exemption does not apply to disposal of ordnance at a location that is designated for repeated detonations on a routine basis.

Former range sites that are no longer designated under Real Property as within an active operational or impact area are eligible to be managed under the MMRP. Transport of soil or sediment with munition or munition debris constituents without a previously approved regulatory document, or as a part of an MMRP managed site, would also be a violation of state and Federal waste rules and regulations. Depending on the constituent, they would be included in the regulatory framework under CERCLA or RCRA.

3.7.1.3 Land Use Controls

Land Use Controls (LUCs) are remedial actions that include any type of physical, legal, or administrative mechanism that restricts the use of property in accordance with a remedial decision. LUCs, as applied to real property, refers to any restriction or control that limits the use of any portion of that property, including water resources, arising from the need to protect human health and the environment. LUCs are used to mitigate risks associated with exposure to in-place residual contamination instead of eliminating those risks through removal actions or implementation of other remedial measures.

The RCRA Permit (Number SC3 210 020 449) is the primary administrative LUC for Fort Jackson, as well as inclusion of these sites within the RPMP. The RCRA permit is the governing document for all Fort Jackson SWMUs and AOCs. The permit outlines the regulations and requirements for all corrective actions, including LUCs. The routine management and its associated compliance

with LUCs involve utilization of Fort Jackson's recognized environmental condition process. No project at SWMUs and AOCs can proceed until all significant impacts are mitigated to non-significant levels through adherence to the review procedures established under the recognized environmental condition process. In accordance with the Fort Jackson RCRA Permit, when LUCs are part of a final corrective action, written notification (Request for Proposed Change [RPC]) must be provided to SCDHEC at least 60 days prior to implementation of any Significant Change in Land Use (except in emergency situations, in which notice should be given as soon as practicable). This may include typical above-grade activities, such as timber harvesting. LUCs may also include limited access and prohibition of excavation. Any subsurface proposed activities must be submitted with an RPC and, due to the historic nature of the subject property, on-call construction support for UXO, MC, munitions debris, and munitions and explosives of concern for potential safety concerns may be warranted.

3.7.1.4 PFAS Chemicals

The DoD has identified certain per- and polyfluoroalkyl substances (PFAS) as emerging contaminants of concern which affected installations across the Army. Perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutane sulfonic acid (PFBS) are components of Aqueous Film Forming Foam (AFFF) that the Army began using in the 1970s as a firefighting agent to extinguish petroleum fires.

On March 14, 2023, USEPA announced the proposed National Primary Drinking Water Regulation (NPDWR) for six PFAS including PFOA, PFOS, perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA, commonly known as GenX Chemicals), perfluorohexane sulfonic acid (PFHxS), and PFBS. The proposed PFAS NPDWR does not require any action until it is finalized. USEPA anticipates finalizing the regulation by the end of 2023 (USEPA, 2023a). Establishment of Maximum Contaminant Levels is forthcoming. Fort Jackson will abide by all sampling and reporting requirements outlined in upcoming PFAS guidelines.

Should PFAS contaminated soils be identified during construction or demolition activities, contaminated soil would be disposed in accordance with the most recent Army PFAS disposal guidelines.

3.7.2 Environmental Consequences

3.7.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Potential environmental hazards from the Solar PV System would occur primarily at the construction and disposal stages, which would be done off-site. Best management practices such as keeping construction equipment in good operating condition, properly labeling, storing and handling fuels, and cleaning leaks and spills immediately would be implemented to reduce the risk of spills or other means of contamination during construction. Solar PV modules may contain small amounts of hazardous materials that pose no threat under normal circumstances. However, those materials could potentially release hazardous substances into the environment if damaged. Chemical energy storage devices would pose additional risks as the chemicals used in these

devices are frequently toxic and/or hazardous. Most battery-based storage devices use high-strength acids, and the specific chemistry of the device could also include smaller amounts of other toxic and/or hazardous materials. The volume of the toxic and/or hazardous materials will depend on the size of the energy storage device. If a spill were to occur, BMPs and procedures established in the Installation Spill Contingency Plan or equivalent document will be implemented, and contaminated soil and other hazardous waste will be disposed of properly. The Fort Jackson Environmental Division must be contacted when there is a spill, and all disposal documents must be provided. No adverse impacts are expected from hazardous waste generation under Alternative 1. No IRP sites, LUC properties are present within or near the properties to be developed under Alternative 1. No PFAS containing materials would be used, or are known to be present, at COA 1 or TDC-1. No ACM, LBP, or PCBs are anticipated to be encountered at COA 1 or TDC-1.

Alternative 2 – COA 1, TDC-2

Impacts and site conditions under Alternative 2 would be the same as those described in Alternative 1. Applicable BMPs would be implemented to reduce or eliminate the likelihood of impacts.

Alternative 3 – COA 2

Impacts under Alternative 3 from actions directly related to construction and disposal activities, and the hazardous material associated with Solar PV modules would be the same as those described under Alternatives 1 and 2. No PFAS is expected to be encountered within COA 2.

COA 2 overlaps three AOCs/IRP Sites: AOC D, AOC E, and AOC F. AOC F was historically utilized as a hand grenade court for training in the 1940s and 1950s. During the 1970s and 1980s, AOC F was utilized for field fortification training. AOC F overlaps the 300 yard Camp Jackson Ranges (AOC D) and Small Arms Ranges east of Chesnut Road (AOC E), which are both in Long Term Monitoring for LUCs (SCDHEC, 2017). AOC D, E, and F account for approximately 24.6 acres, 28.7 acres, and 32.5 acres of COA 2, respectively, resulting in a total of 41.5 acres of COA2 occupied by an AOC. Locations of the AOCs are shown in **Figure 3-1**.

MECs are of a concern in AOC F. Therefore, a 100% surface clearance for MEC (MEC detection, recovery, and disposal) to remove explosive hazards on or near the ground surface would be required prior to development. Following surface clearance for MEC, LUC would be implemented (SCDHEC, 2017). The LUCs include the following:

- Site Access Controls
- Signage indicating the limited access and a safety advisory
- Adhering to the administrative Record of Environmental Consideration (REC) process which provides further structure to limiting access for any potential site utilization changes or projects
- Addition of a note in the RPMP indicating that the areas where the ranges were located and used for munitions training in the past.

AOCs D, E, and F are unlikely to pose an unacceptable risk to human health and the environment following Corrective Measures Implementation of surface clearance activities, followed with Long

Term Monitoring for LUCs (SCDHEC, 2017). Therefore, minor long-term impacts are expected from operation within the AOC areas.

No Action Alternative

Under the No-Action Alternative, hazardous materials and waste generation within the project area would remain unchanged because the Proposed Action would not be implemented.

3.7.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Potential environmental hazards from the Natural Gas Generator Units would occur primarily at the construction and disposal stages, which would be done off-site. Construction-phase BMPs, such as those detailed in **Section 3.7.2.1**, would be implemented. No IRP sites or LUCs are located near the proposed Natural Gas Generator or pipeline under Alternative 1.

Small quantities of hazardous waste would be generated over the operational lifetime of the Natural Gas Generator Units. Typical wastes generated in annual and as-needed maintenance includes, but is not limited to, used coolant, lubricating oil, air filters, and spark plugs. Fort Jackson's RCRA permit does not have limits on the generation of hazardous waste. Wastes would be handled and disposed of in accordance with regulations described in **Section 3.7.1** and Fort Jackson's waste policy.

Natural gas is toxic if inhaled in significant quantities. With proper generator maintenance and reliance on engineered failsafes, no toxic natural gas is expected to be released from either the generator or associated pipeline.

PCB contamination in Hill Street Substation soils is not confirmed, but possible due to the age of the substation equipment. If PCBs were to be detected, cleanup would be undertaken as a joint effort between Dominion Privatization South Carolina, a subsidiary of DESC, and the Fort Jackson Environmental Division. No ACM or LBP is anticipated to be encountered at COA 3.

Overall impacts due to hazardous materials and waste under Natural Gas Generator Alternative 1 are expected to be minor and long-term.

Alternative 2 – COA 4

Impacts under Alternative 2 would be the same as those described under Alternative 1; however, development of COA 4 would not disturb a substation property. COA 4 is, however, located in close proximity to Moseby Street Substation. Due to its proximity to a substation, occurrence of PCB contamination is possible, yet unlikely. While presence of PCBs is possible, none are anticipated to be encountered. Impacts due to hazardous materials and waste under Natural Gas Generator Alternative 2 are expected to be minor and long-term.

3.7.2.3 No Action Alternative

Under the No-Action Alternative, hazardous materials and waste generation within the project area would remain unchanged because the Proposed Action components would not be implemented.

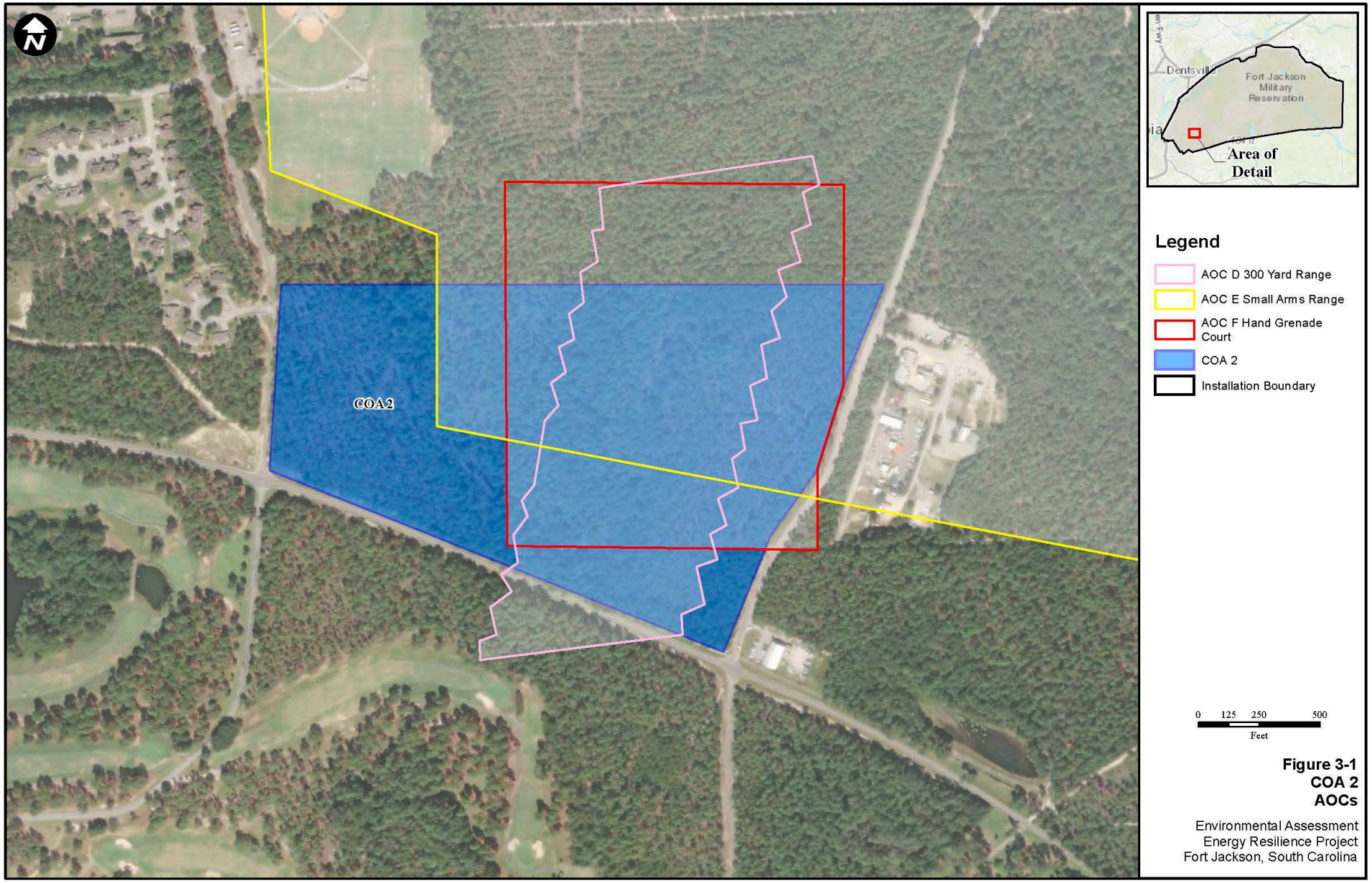

Figure 3-1
COA 2
AOCs

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3.8 SAFETY AND OCCUPATIONAL HEALTH

3.8.1 Affected Environment

Safety issues are those that directly affect the protection of human life and property, and principally involve aviation, munitions, and fire prevention. In addition, Fort Jackson personnel are protected by observing OSHA standards, as well as Army Regulation 385–10, *The Army Safety Program*, Fort Jackson Regulation 385-10, *Safety and Occupational Health*, and RCRA requirements.

A safe environment is one in which there is little to no potential for serious bodily injury or illness, death, or property damage, or the potential risk has been reduced to the maximum extent possible. Safety addresses the well-being, safety, and health of members of the public, contractors, and Fort Jackson personnel during project implementation, including demolition and construction, and also during subsequent operations and maintenance.

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation include the presence of the hazard itself, together with the exposed and susceptible population. The degree of exposure depends primarily on the proximity of the hazard to the population. Hazardous activities can include construction, demolition, transportation, tree clearing, maintenance and repair activities, the creation of noisy environments, and certain military activities. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation process creates unsafe environments for nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns. This analysis addresses the safety implications from construction, transportation, and system operation activities associated with the Proposed Actions. The safety-related ROI for this EA corresponds to the footprints of the individual Proposed Actions where construction and operational activities would occur.

Activities associated with the Proposed Action would occur within or near the existing buildings and/or their adjacent parking areas. Ground transportation within the Base is serviced by a network of roadways for vehicular transportation of personnel. These areas are served by a network of existing paved roads and parking areas. Construction crews would use established haul routes for materials transport and removal of waste.

3.8.2 Environmental Consequences

3.8.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

During construction of the proposed Solar PV System, safety would be an inherent priority. Fort Jackson requires its contractors and heavy equipment operators to adhere to all applicable safety regulations and guidelines. Construction safety adverse impacts would be negligible, localized, and short-term. Work would be scheduled to minimize any interruptions to utility services and avoid disturbance to on-base personnel. Also, any brief interruptions while switching from old infrastructure would be scheduled through the Base outage process to minimize potential impacts. There are no plans for extended durations of utility outages.

The proposed parcels are serviced by a network of existing paved roadways. There would be a temporary increase in traffic from vehicles and equipment during construction. These activities would require the temporary employment of workers, contributing to traffic. Short-term adverse impacts are anticipated due to potential reroutes or road closures associated with the proposed construction. Once construction is completed, transportation patterns are expected to revert to pre-construction direction and frequency.

Risks associated with systems maintenance would be minimal in part because Solar PV arrays are benign systems with no moving parts. Some risks would be associated with module cleaning if workers are elevated above ground height to clean modules. Likewise, solar energy storage systems and microgrid systems typically have few moving parts, but still pose a risk in the event of unintended discharge or overheating. Switching equipment failure or unintentional activation could lead to overloading on power distribution lines which could pose a fire hazard. Such risks are only slightly greater than the use of on-base distribution lines due to the inclusion of additional switching and protective electrical equipment. Electric shock hazard risks would also be associated with maintenance of transmission lines and other electrical conductivity components. All risks associated with maintenance activities would be minimized through implementation of applicable safety requirements, proper maintenance of tools and equipment used to conduct Solar PV System maintenance activities, and appropriate security to prevent access by unauthorized personnel. Therefore, impacts to safety stemming from systems maintenance would be negligible and long-term.

Alternative 2 – COA 1, TDC-2

Impacts to safety from construction, traffic, and systems operations would be the same as those described under Alternative 1. Overall impacts to construction and traffic safety are anticipated to be negligible and short-term. Safety impacts from continued operation of the Solar PV System are anticipated to be minor and long-term.

Alternative 3 – COA 2

Impacts to safety from construction, traffic, and systems operations would be the same as those described under Alternatives 1 and 2. However, the historical site use as a hand grenade range has the potential to introduce additional safety hazards. Approximately 32.5 acres of the 60.3 acre COA 2 parcel are located within AOC F, which was historically used as a Hand Grenade Court, and has the potential to contain MECs. Procedures under Army Safety and Range Regulations provide guidance for identifying UXO. Fort Jackson's IRP establishes procedures to investigate and clean up UXO. Potential safety impacts would be avoided through proper implementation of these procedures. Safety impacts under Alternative 3 would therefore be minor and long-term.

No Action Alternative

Under the No-Action Alternative, safety within the project area would remain unchanged because the Proposed Action components would not be implemented.

3.8.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Construction activities related to installation of the Natural Gas Generator Units and gas pipeline would be conducted in accordance with Fort Jackson's safety standards and procedures. Activities including excavation, generator and pipeline assembly, HDD, and backfilling would occur along potentially busy roadways. These activities would require the temporary employment of workers, contributing to traffic. There would be a temporary increase in traffic from vehicles and equipment during construction. Traffic control and management plans would ensure the safety of contractors and personnel during these development activities. Short-term adverse impacts are anticipated due to potential reroutes or road closures associated with the proposed construction. Adverse impacts from construction activities would be negligible, localized, and short-term.

Operational safety issues from natural gas generators are different in nature from that of solar units. Fort Jackson would conduct Natural Gas Generator Units operations in accordance with the manufacturer's guidelines to ensure adherence with proper safety measures. Typical hazards associated with natural gas generator units include electrocution, burns, and sound-related issues. Operations personnel would follow the installation Personal Protective Equipment (PPE) guidelines and be trained in the necessary risk-mitigating procedures required for electrical work. The high noise levels generated during operation are expected to only pose a potential risk to operations personnel within very close proximity to the generator. These risks can be adequately avoided with proper use of hearing protection. Operational safety impacts under Alternative 1 would therefore be minor and long-term.

Alternative 2 – COA 4

Impacts to safety from construction, traffic, and systems operations would be the same as those described under Alternative 1. Overall impacts to construction and traffic safety are anticipated to be negligible and short-term. Safety impacts from continued operation of the Natural Gas Generator Units are anticipated to be minor and long-term.

No Action Alternative

Under the No-Action Alternative, safety within the project area would remain unchanged because the Proposed Action components would not be implemented.

3.9 GEOLOGY AND SOILS

Geologic resources include subsurface and exposed rock. Soils include particulate, unconsolidated materials formed from in place underlying bedrock or other parent material, or transported from distant sources via glacial transport, water, and wind. Soils serve a critical role in the natural and human environment, affecting vegetation and habitat, water and air quality, and the success of the construction and stability of roads, buildings, and shallow excavations. The ROI is the land within Fort Jackson.

3.9.1 Affected Environment

3.9.1.1 Physiography, Geology, and Topography

Fort Jackson is located in Richland County, which contains two physiographic provinces: the Piedmont Plateau and the Atlantic Coastal Plain. Fort Jackson is located in the northwestern portion of the Atlantic Coastal Plain, referred to as the "Sand Hills", which joins with the Piedmont Province running north and west. The Sand Hills are a region of low to moderate relief and gently rolling plains with numerous streams and springs that are fed by groundwater. Local relief in the high plains of the reservation is largely between 165 and 250 feet. Slopes are predominately between 3% and 8% at Fort Jackson. In the areas along narrow stream valleys, slopes commonly exceed 15%.

The highest elevation on Fort Jackson is 540 feet above sea level in the west-central portion, while the lowest point is less than 160 feet above sea level occurring in the floodplain of Colonels Creek in the southeastern portion. The second physiographic province, known as the Piedmont Plateau, also contains numerous streams and water bodies. Ridge tops are broad sloping gentle to moderate toward the streams, and the stream floodplains are often narrow. The Fall Line, which marks the boundary between the younger, softer sediments of the Coastal Plain Province and the ancient, crystalline rocks of the Piedmont Province, lies approximately four miles west of the cantonment area.

Rocks in the Piedmont Plateau are shale and schist, rather than true slate. The principal rock type is argillite, a fine-grained rock with a high content of silica and alumina. The principal geologic formation in the Sand Hills is the Tuscaloosa, consisting of unconsolidated marine deposits of light-colored sands and kaolin clays. Most of the soils at Fort Jackson are formed from sediment of the Tuscaloosa. A layer of Quaternary sand terrace overlies the Tuscaloosa formation, which lies upon a complex of old metamorphic and igneous rock. The Tuscaloosa complex generally consists of clay strata overlying unconsolidated sands. Near the northern boundary of the installation, the older crystalline rocks of the Carolina Slate Group outcrop at the surface. In the northwestern portions of Fort Jackson, Pleistocene sands and gravel are present at the ground surface.

3.9.1.2 Soils

Soils play a critical role in the natural and human environment, affecting vegetation and habitat, water and air quality, and the success of construction and stability of infrastructure. Soil surveys prepared by the United States Department of Agriculture (USDA) concluded that soils in the Fort Jackson coastal plain are predominantly well drained on the higher plains and side slopes and somewhat poorly drained in the valleys. These soils have a sandy surface layer and a predominantly loamy sub-soil. Primary soil classifications are identified as follows: Ailey loamy sand, Fuquay-Urban land complex, Lakeland sand, Pelion-Urban land complex, and Pelion loamy sand (USDA, 2023).

3.9.2 Environmental Consequences

This section discusses potential impacts to earth resources located within the area of the various alternatives being evaluated. Exposure to potential geologic hazards and potential for soil erosion

and soil limitations were considered when evaluating impacts to soils and geology. Generally, impacts can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering designs are incorporated into project development.

Impacts to soils can result from disturbances, such as grading during construction activities that exposes soil to wind or water erosion. Impacts resulting from geologic hazards can occur where the potential for harm to persons, property or the environment is high due to existing hazards.

3.9.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Construction and demolition activities involving tree clearing, grading and site preparation activities would have direct, negligible, short-term adverse impacts on physical resources. The COA 1 parcel consists of Ailey loamy sand, Pelion-Urban land complex, and Vaucluse loamy sand (**Figure 3-2)**. The TDC-1 parcel consists of Pelion loamy sand and Vaucluse loamy sand (**Figure 3-3)**. These soils have no risk of flooding and have low susceptibility to erosion. With flood control and proper drainage measures, there are no major limitations that would preclude these soil types from development. Soils would be moved, and sedimentation could occur while the ground cover becomes established. To minimize impacts, erosion and sedimentation control measures would be implemented, including the use of BMPs at the construction sites, such as silt fencing, hydro-mulching, sediment traps, and vegetated filter strips. Clearing of timber and grading around the development area would be required during construction, and result in negligible long-term impacts to topography. Geologic resources would remain unaffected by the Proposed Action components because there is no substantial excavation associated with this action that would impact site geology. All activities would be conducted in accordance with applicable Federal, state, and Army regulations.

Alternative 2 – COA 1, TDC-2

Impacts under Solar PV System Alternative 2 would be similar to those described under Alternative 1. However, fewer trees would be required to be removed, therefore reducing the intensity and duration of soil disturbance resulting from the Proposed Action component. The TDC-2 parcel consists of Blanton sand and Vaucluse loamy sand (**Figure 3-3)**. These soils have no risk of flooding and have low susceptibility to erosion. There are no issues that would preclude these soil types from development. The total developable area of Alternative 2 would be roughly half that of Alternative 1, further reducing impacts under this alternative. Potential adverse impacts to physical resources would be reduced in comparison to Alternative 1, resulting in an overall less than significant, negligible, short-term adverse impact.

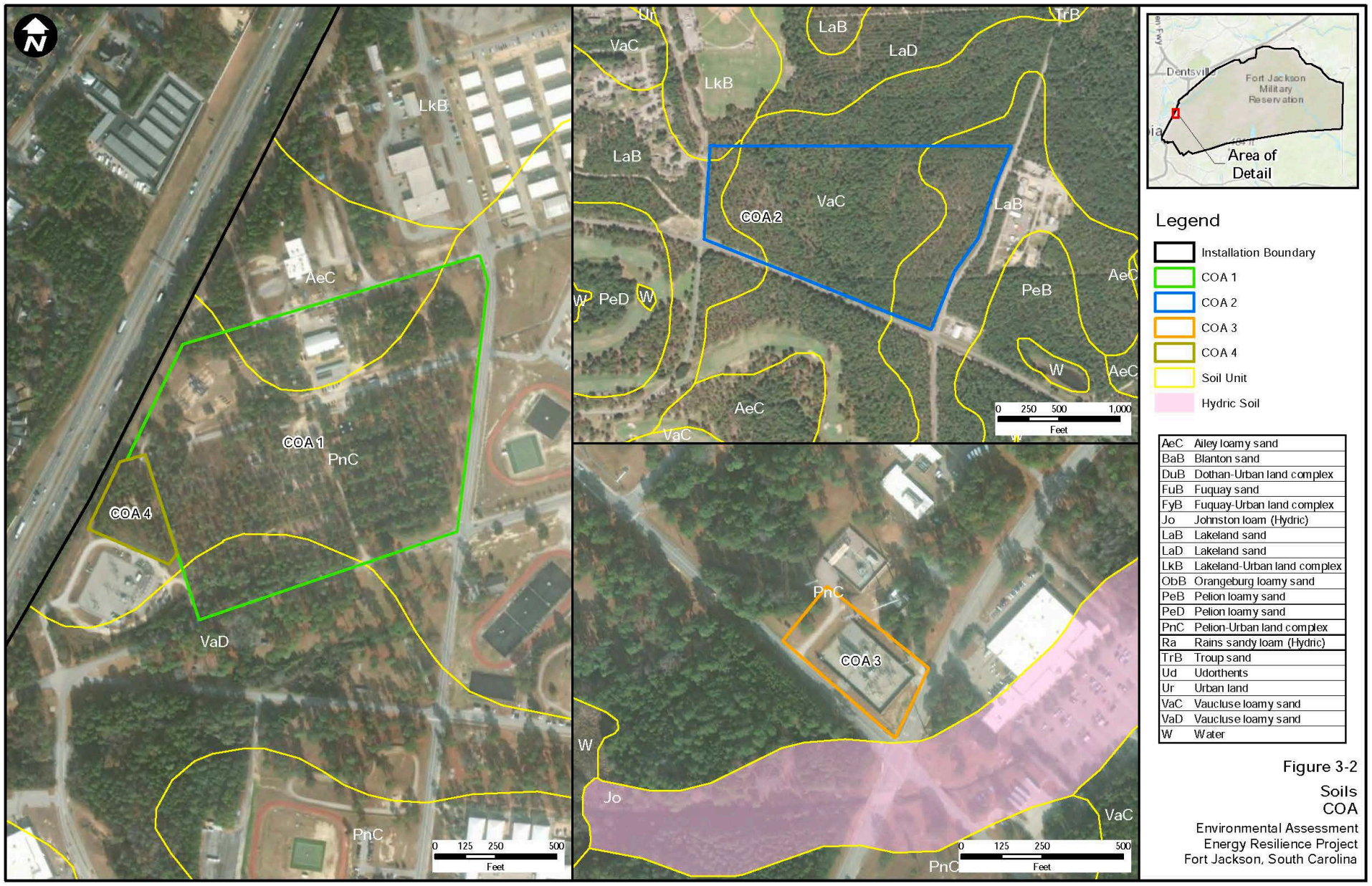

Figure 3-2
Soils
COA
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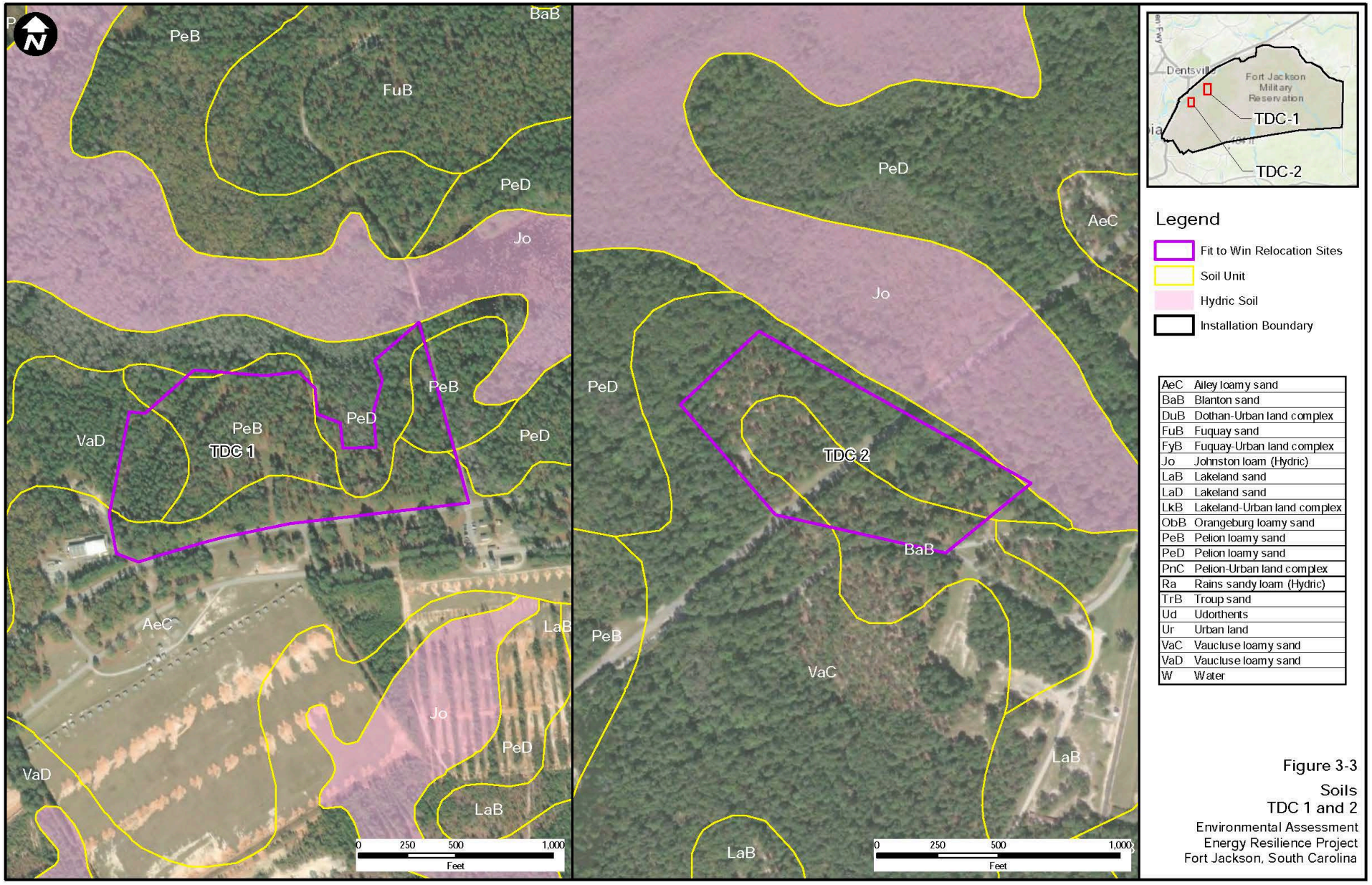

Figure 3-3
Soils
TDC 1 and 2
Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

Alternative 3 – COA 2

Tree clearing, construction, and demolition activities would be similar to those described under Alternative 1 and 2. The COA 2 parcel consists of Lakeland sand and Vaucluse loamy sand (**Figure 3-2)**. These soils have no risk of flooding and have low susceptibility to erosion. There are no issues that would preclude these soil types from development. Development on the 60.3 acre property would result in twice the developed area seen under Alternative 1, and four times the area developed under Alternative 2. Potential adverse impacts to physical resources would therefore be greater than Alternatives 1 and 2 should the entirety of the COA 2 parcel be developed. Direct, minor, short-term adverse impacts on physical resources would be expected.

No Action Alternative

The No Action Alternative would result in no significant impacts to physiography, topography, or geology. The properties would remain in their current condition with no tree clearing, construction, or demolition activities being conducted.

3.9.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Development activities involving site preparation, generator unit construction, and trenching and HDD for the 9,000 foot gas pipeline would have direct short-term adverse impacts on physical resources. The COA 3 parcel consists of Pelion-Urban land complex (**Figure 3-2)**. This soil has no risk of flooding and a low susceptibility to erosion. There are no issues that would preclude this soil type from development. The COA 3 pipeline crosses through two hydric soil types; Johnston loam and Rains sandy loam (**Figure 3-4)**. These soils have a moderate erosion hazard but has frequent flooding, which can potentially occur for durations of up to a month between January and July, and again through November and December (USDA, 2022). Alteration of existing soils would occur due to HDD, but impacts would be localized to the drilling site and the soils displaced by the pipe construction during trenching activities. As discussed in **Section 3.8.2.1**, erosion and sedimentation control BMPs would be utilized to reduce erosion hazards during pipeline installation, with construction activities potentially avoided within months susceptible to flooding conditions. Geologic resources would remain unaffected by the Proposed Action components. Grading of the development area would be required during construction, and result in negligible long-term impacts to topography.

Alternative 2 – COA 4

Impacts under Natural Gas Generator Units Alternative 2 would be similar to those described under Alternative 1. The COA 4 parcel consists of Pelion-Urban land complex, the same soil series as seen in COA 3 (**Figure 3-2)**. No hydric soils would be encountered in the COA 4 pipeline area (**Figure 3-5)**. Development would therefore be unaffected by soil composition. The gas pipeline constructed under Alternative 2 would be 13,000 feet long. Potential adverse impacts to physical resources would therefore be greater than Alternative 1 due to the increased trenching and HDD that would be required. Direct, negligible, short-term adverse impacts on physical resources would be expected.

No Action Alternative

The No Action Alternative would result in no significant impacts to physiography, topography, or geology. The properties would remain in their current condition with no generator unit construction, trenching, or HDD activities being conducted.

Figure 3-4
Soils
Proposed Pipeline COA 3
Environmental Assessment
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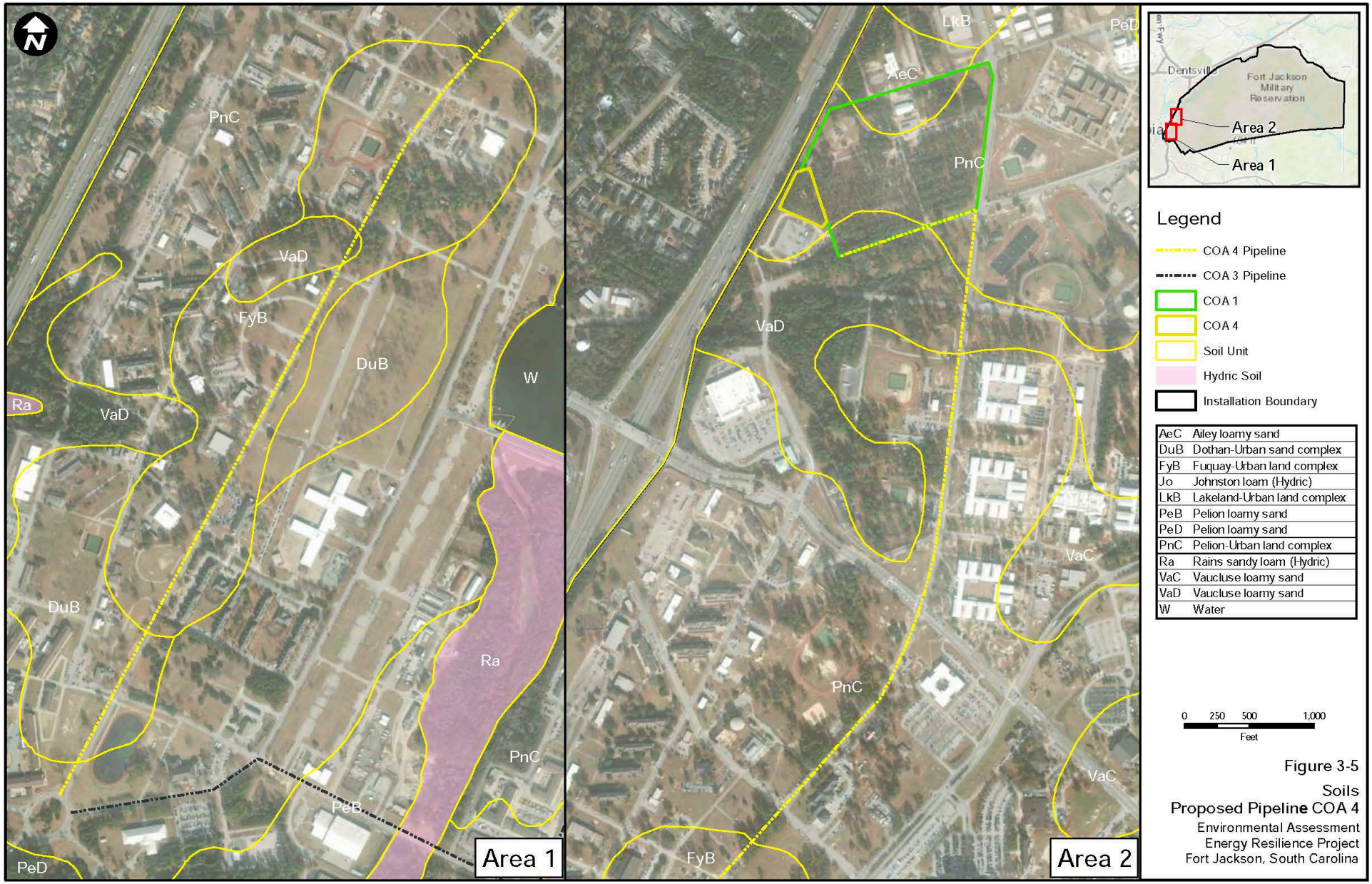

Figure 3-5
Soils
Proposed Pipeline COA 4
Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

3.10 SOCIOECONOMIC RESOURCES AND ENVIRONMENTAL JUSTICE

3.10.1 Affected Environment

Socioeconomic resources typically consider population, income, employment, housing, and community services. This section discusses the socioeconomic resources that have the potential to be impacted by activities associated with the Proposed Action occurring on and surrounding the Proposed Action.

Concern that certain disadvantaged communities may bear a disproportionate share of adverse health and environmental effects compared with the general population led to the enactment of EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* in 1994. This EO directs federal agencies to address disproportionate environmental and human-health effects in minority and low-income communities. EO 12898 applies to federal agencies conducting activities that could substantially affect human health or the environment.

The evaluation of environmental justice is designed to:

- Focus attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities with the goal of achieving environmental justice.
- Foster nondiscrimination in federal programs that may substantially affect human health or the environment.
- Give minority communities and low-income communities greater opportunities for public participation in, and access to, public information on matters relating to human health and the environment.

3.10.1.1 Regional Economy

Fort Jackson is a major contributor and employer of the local, regional, and state economy. The largest source of economic impact from Fort Jackson derives from its base operations, including civilians and military procurement and pay-roll. Additionally, a large portion of money is circulated by visitors who come to Fort Jackson for official reasons, or for family day and graduation ceremonies. Fort Jackson is directly responsible for approximately $2.0 billion in annual economic activities. This leads to an additional $2.7 billion in economic multiplier effects, the result of increased demand for goods and services of local suppliers, and procurement activity at the installation. The combined economic activity is associated with 41,356 jobs and $2.1 billion in labor income. Industrial sectors most impacted by Fort Jackson include medical services, retail stores, and construction (SCDVA, 2022). The installation supports more than 3,500 active duty soldiers and their approximately 12,000 family members.

The ROI for socioeconomics and environmental justice is Fort Jackson, the Columbia metropolitan area, and Richland County. The median income of the ROI is lower than the county and national levels. The household median income in Columbia is $48,701 and the average median income in Richland County is $64,623 as detailed in **Table 3-5**.

Table 3-5: Socioeconomic Data

County	Population	Median Income ($)	Civilian Labor Force	Total Employment	Unemployment Rate
Richland County	421,566	$56,137	63%	157,908	3.3%
City of Columbia	139,698	$ 48,701	58.2%	N/A	3.1%
South Carolina	5,282,634	$58,234	59.6%	1,936,015	3.3%
United States	333,287,557	$69,021	63.1%	8,148,606	3.7%

Source: USCB, 2023a; USCB, 2023b; USCB, 2023c

3.10.1.2 Housing

There are currently 866 unaccompanied enlisted personnel housing spaces available for both assigned and visiting personnel. The Army provides transient lodging for soldiers and their families on temporary duty and during permanent change of station travel.

The Army has an initiative to improve facilities and services for transient lodging known as the Privatization of Army Lodging. This program authorizes the Army to obtain private capital by leveraging government contribution and make efficient uses to limited resources by using a variety of private-sector approaches to build, renovate, and operate lodging.

Approximately two thirds of permanent military personnel live off-installation, with almost half owning their own homes, and the remaining rent single-family homes, apartments, or mobile homes. The presence of stable military personnel of Fort Jackson has resulted in an adequate supply of off-installation housing options and prices (OneSource, 2023).

3.10.1.3 Environmental Justice

Table 3-6 lists the percentage of minority, low-income, and youth populations against the community of comparison (COC) results. The COC values represent the percentages of minority and low-income populations within a geographic extent representing the ROI. Locations where the area of concern percentages are greater than the COC percentages are identified as having potential environmental justice concerns. Typically, countywide percentages have been used for the area of concern and statewide percentages for the COC. As indicated in **Table 3-5** and **Table 3-6**, all of the Richland County has a higher percentage minority population and a higher percentage of low-income individuals than state averages.

Table 3-6: South Carolina Environmental Justice Data

County	Population	Minority (%)	Low Income (%)	Youth (%)	Per Capita Income
Richland County	421,566	58.2%	17.0%	21.2%	$32,952
City of Columbia	139,698	52.0%	24.3%	17.5%	$32,954
State of South Carolina	5,282,634	36.5%	14.6%	21.2%	$32,823

Source: USCB, 2023a; USCB, 2023b; USCB, 2023c

3.10.1.4 Protection of Children

Environmental justice analysis also addresses the protection of children, as required by EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (Protection of Children). EO 13045 was issued in 1997 to identify and address issues that affect the protection of children. According to the EO, all federal agencies must assign a high priority to addressing health and safety risks to children, to coordinating research priorities on children's health, and to ensuring that their standards take into account special risks to children. The EO states "…environmental health risks and safety risks' mean risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to)". Children live at Fort Jackson as residents and visitors (e.g., residing in Fort Jackson family housing, using recreational facilities, attending on-installation events). The Army takes precautions for their safety through a number of means, including fencing, limiting access to certain areas, and requiring adult supervision.

3.10.2 Environmental Consequences

3.10.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Alternative 1 would result in short-term beneficial impacts to socioeconomics within the ROI. Beneficial impacts to the regional economy would occur as a result of hiring construction crews during the development phase and hiring skilled labor for the installation of the solar elements. Compared to the 10,000-plus full-time permanent workers on most major Army installations, this short-term impact is minor. There are no indications that development of the Proposed Action would be contrary to the goals of EO 12898 or would disproportionately impact environmental or human-health in minority and low-income populations within the ROI. Short-term beneficial impacts are expected from the hiring of local labor during the construction phase. There would be no adverse impacts to housing under this alternative. Development under Alternative 1 is not anticipated to result in conditions which would adversely affect the long-term safety or health of children because no aspect of the Proposed Action would be anticipated to disproportionately increase the risks described in EO 13045. Construction and demolition activities may result in temporary releases of fugitive dust and the creation of noisy environments due to construction machinery. Exposure to these environmental factors would likely only occur if children were occupying a vehicle in transit within close proximity to the COA property during active construction or demolition activities. Proper BMPs would be implemented during these activities to reduce or eliminate conditions that may affect sensitive populations like children. Therefore, no adverse impacts to children are expected.

Alternative 2 – COA 1, TDC-2

Impacts to socioeconomic resources and environmental justice would be the same as those described under Alternatives 1. Minor beneficial impacts to the regional economy and minority and low income populations are expected. No adverse impacts to children or housing within the ROI are expected.

Alternative 3 – COA 2

The proximity of COA 2 to Pinckney Elementary School and Pierce Terrace Elementary School would result in temporary minimal impacts to children. Any non-naturally attenuated noise may penetrate into the school properties. Nearby housing units would also be exposed to potentially elevated noise levels. There is potential for fugitive dust emissions during construction and demolition activities, however BMPs would be implemented during these activities to reduce or eliminate conditions that may affect sensitive populations. Adverse impacts to children and housing from noise and fugitive dust are therefore expected to be short-term and temporary, being limited only to periods where construction or demolition activities are taking place. No aspect of the Proposed Action is anticipated to disproportionately increase the risks described in EO 13045. Benefits to the regional economy would be the same as those described under Alternative 1.

No Action Alternative

Under the No-Action Alternative, there would be no impacts to socioeconomic resources or environmental justice within the ROI. The project area would remain unchanged because the Proposed Action components would not be implemented.

3.10.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

The proximity of COA 3 to Hood Street School Age Services, Lee Road CDC, Scouts Out CDC, and Pickens CDC would result in temporary minimal impacts to children. Any non-naturally attenuated noise may penetrate into the school properties. Impacts under Natural Gas Generator Unit Alternative 1 would be the same as those described under Solar PV System Alternative 3. There are no indications that development of the Proposed Action would be contrary to the goals of EO 12898. Short-term beneficial impacts are expected to the regional economy and minority workers from the hiring of local construction personnel within the ROI. No adverse impacts to children or housing within the ROI is expected because no aspect of the Proposed Action would be anticipated to disproportionately increase the risks described in EO 13045.

Alternative 2 – COA 4

Impacts under Natural Gas Generator Units Alternative 2 would be the same as those described under Solar PV System Alternative 1 and Natural Gas Generator Units Alternative 1. No significant impacts to socioeconomic resources are expected.

No Action Alternative

Under the No-Action Alternative, there would be no impacts to socioeconomic resources or environmental justice within the ROI. The project area would remain unchanged because the Proposed Action components would not be implemented.

3.11 TRANSPORTATION AND TRAFFIC

The ROI for transportation is defined as the Installation and its immediate vicinity. An established transportation network brings soldiers for basic training from locations nationwide. While the primary means of transportation is via roadway network, the proximal location to the greater

Columbia region provides potential connectivity to a transportation network that adds mass transit and air, rail, port, and freight facilities as well as pedestrian trails and bike paths.

3.11.1 Affected Environment

Transportation within Fort Jackson is provided via a network of paved primary, secondary, and tertiary roads, as well as a system of unpaved roads and fire breaks that is used extensively for training operations. Fort Jackson has more than 207 miles of roads, of which 133 miles are paved and 74 miles are unpaved. Paved roads have a bituminous surface and are in good condition. The unpaved roads are in the training and range areas.

Roadways within the cantonment area can be characterized as continuous two- or four-lane roads with 12-foot travel lanes, paved shoulders, and sidewalks. These roadways form a loose grid pattern. Primary east-west roadways include Boyden Arbor Road, Hampton Parkway, Strom Thurmond Boulevard, Semmes Road, and Anderson Street. Primary north-south roadways include Jackson Boulevard, Lee Road, and Dixie Road. Several intersections along Strom Thurmond Boulevard, Semmes Road, and Forrest Road are congested during peak travel periods.

Fort Jackson can be accessed by four gates with Access Control Points (ACPs) per anti-terrorism/force protection requirements in order to maximize security. They are located within the vicinity of the cantonment area and are the only right-of-entries with permanent and standardized facilities to safely screen vehicular movements. Gate 1 (Jackson Boulevard) and Gate 5 (Semmes Road) may only be used by personnel with a DoD identification card. Gate 2 (Main Gate to Strom Thurmond Boulevard) is the main entrance for unescorted visitors, and the only ACP that has continuous hours of operation. Gate 2 is also the main entrance for visitors on Family/Graduation days. Gate 4 (Boyden Arbor Road) serves some traffic on Family/Graduation Days and must be used by all commercial and delivery vehicles. During peak commuter periods on normal weekdays, queuing and congestion occur at Gates 1, 2, and 4 causing substantial delays. Inbound traffic waiting to be processed can accumulate onto I-77.

Normal, daily traffic patterns are disrupted by two functions that are vital to the mission: physical training and graduation ceremonies. There are approximately five miles of sidewalk. A portion of the Palmetto Trail (a recreational trail that traverses the state) is located along the southern portion of the Installation with trailheads located at Gate 1 and Gate 5. Bicycle traffic is prevalent, although there are no dedicated bicycle lanes, which can be a safety hazard.

3.11.2 Environmental Consequences

3.11.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

COA 1 and TDC-1 are serviced by a network of existing paved roadways. There would be a temporary increase in traffic from vehicles and equipment during construction. These activities would require the temporary employment of workers, contributing to traffic. Under Alternative 1, temporary minor short-term impacts are anticipated due to potential reroutes or road closures associated with the proposed construction and demolition. Once construction is completed, transportation patterns are expected to revert to pre-construction direction and frequency.

Alternative 2 – COA 1, TDC-2

Impacts under Solar PV System Alternative 2 would be the same as those described under Alternative 1. Temporary minor short-term impacts are anticipated due to potential reroutes or road closures.

Alternative 3 – COA 2

Impacts under Solar PV System Alternative 3 would be the same as those described under Alternative 1. Temporary minor short-term impacts are anticipated due to potential reroutes or road closures.

No Action Alternative

Under the No-Action Alternative, there would be no impacts to transportation, and traffic within the project area would remain unchanged because the Proposed Action would not be implemented.

3.11.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

COA 3 is serviced by a network of existing paved roadways. There would be a temporary increase in traffic during construction from vehicles, equipment, and the temporary employment of workers, contributing to traffic. Temporary minor short-term impacts are anticipated due to potential reroutes or road closures associated with the proposed construction and demolition. Construction of the COA 3 pipeline would occur within close proximity to, or within the roadway of Lee Road, Anderson Street, and Marion Ave. Traffic control would be required during construction activities. Construction would be limited in peak hours or during events to reduce the impact on traffic flow and the need for reroutes. Once construction is completed, transportation patterns are expected to revert to pre-construction direction and frequency.

Alternative 2 – COA 4

Impacts under Natural Gas Generator Units Alternative 2 would be the same as those described under Alternative 1. The COA 4 pipeline construction may require construction along or within the Jackson Boulevard and Forrest Road roadway. Temporary minor short-term impacts are anticipated due to potential reroutes or road closures.

No Action Alternative

Under the No-Action Alternative, there would be no impacts to transportation, and traffic within the project area would remain unchanged because the Proposed Action components would not be implemented.

3.12 UTILITIES

3.12.1 Affected Environment

This section describes existing utilities, classified as distribution and collection systems including water, wastewater, and energy sources. Communication systems and solid waste disposal are

also discussed. The ROI is defined as the utility services located within the Fort Jackson cantonment area, including the associated public utility service providers.

The water and sanitary sewer systems, telecommunication systems, and electric and natural gas systems are privatized Installation-wide, including Residential Communities Initiative housing. Water and wastewater systems are privatized through the PSUS in accordance with a 50-year privatization contract. PSUS prepared a five-year capital improvement plan, which recommended many capital improvement projects for both the water and wastewater systems from April 2020 through March 2024 (PSUS, 2020).

3.12.1.1 Potable Water

The primary water source for Fort Jackson is the City of Columbia. The water system connects to the City's water system at six points in the cantonment area and at one point outside of the Installation. In addition, there are 11 wells on Fort Jackson that provide drinking water. Seven wells provide water to the ranges, three wells are located by Weston Lake, and one well is located in the Twin Lakes Recreation Area. Under the privatization arrangement, PSUS is responsible for supplying water and operating the potable water system. The City of Columbia performs chlorine-booster treatments and PSUS tests the water weekly. A Contracting Officer's Representative (COR) manages the coordination between the Installation and the supplier.

Water is stored in a two million-gallon elevated storage tank to provide for peak demands and minimize supply fluctuation. The system has been converted from the original dual pressure zone system to a single zone pressure system due to improper connections and lack of planning. Approximately 80-85% of the water enters through one of the connections. Pressure demands in some areas add stress to the system and cause leakage in some of the old piping. Having a majority of the water supply provided through only one connection poses a risk. Should there be a disruption to the primary connection point, it is unknown if enough water can be provided through the other service points.

3.12.1.2 Solid Waste

Solid waste is primarily municipal solid waste, special waste, and demolition debris. Municipal solid wastes generated on Fort Jackson are placed in dumpsters and collected, transported, and disposed of by a private contractor at an off-installation municipal solid waste landfill. There are no active sanitary landfills on the Installation. The DoD has directed continuous reduction in the quantity of non-hazardous solid waste generated, increased diversion of non-hazardous solid waste from disposal facilities, and increased the economic benefit of solid waste recycling. Fort Jackson has an active recycling program regulated by Fort Jackson Regulation 200-9 (Fort Jackson, 2012). There are several drop-off sites for qualifying materials located throughout the Installation.

3.12.1.3 Stormwater Systems

The Directorate of Public Works (DPW) owns and operates the stormwater drainage system, which functions through a network of pipes (approximately 326,000 linear feet, with the largest pipe being 60 inches in diameter) and catch basins into a series of drainage swales and natural drainage ways as well as several lakes.

Stormwater drains from high points along the west and east sides of the cantonment area toward the center of the Fort Jackson, into Semmes Lake and associated creeks, and along the Interstate 77 corridor (western side) that drain directly off-installation untreated. A Storm Utilities Assessment Technical Report analyzed problem areas including undersized pipes, deficient stormwater structures, lack of basic maintenance, sinkholes, or poor grading for drainage (PBS&J, 2010). These issues can create ponding, erosion, and safety concerns affecting the system's ability to function properly.

DPW is responsible for enforcing stormwater regulations on the Installation. Permits must be obtained through SCDHEC prior to any construction disturbing one or more acres.

3.12.1.4 Energy Sources

Electrical

The electrical system was privatized in 2019 by Dominion Privatization South Carolina, LLC and provides power for approximately 800 buildings, including the 4 Central Energy Plants, which consume the most electricity. The distribution system is approximately 30 years old and includes 64 miles of overhead and underground, primary, and secondary lines. Only 10% of the lines are underground, and there is currently no available funding to convert overhead distribution to underground.

Natural Gas

The natural gas system is privatized through DESC. DESC supplies natural gas, primarily for heating and hot water generation through a regulator and meter station north of Gate 1. Approximately 567 million cubic feet of natural gas is delivered from DESC, making up approximately half of the overall energy consumption. The distribution system consists of approximately 37 miles of underground pipe. There are 108 monitoring locations and most of the main buildings are metered.

3.12.2 Environmental Consequences

3.12.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Installation of the Solar PV System under Alternative 1 would replace some of the gas and electrical energy used on the installation with electricity produced by solar, thereby reducing the installation's reliance on fossil fuels. Long-term beneficial impacts to the existing infrastructure would result by providing expanded services to meet the increased needs in both daily, and contingency operations. PSUS has implemented measures in accordance with its existing policies and applicable rules and regulations to minimize potential impacts including implementing BMPs for infrastructure projects. Maintenance and improvement of infrastructure have a long-term beneficial impact on the human and natural environment through increased efficiency of operations, increase in green technologies, as well as decreased costs associated with improved systems. No impacts are expected to utility systems associated with potable water, solid waste, or stormwater systems. No adverse effects to utilities are expected under Alternative 1.

Alternative 2 – COA 1, TDC-2

Impacts under Solar PV System Alternative 2 would be the same as those described under Alternative 1. No adverse effects to utilities are expected under Alternative 1.

Alternative 3 – COA 2

Impacts under Solar PV System Alternative 2 would be the same as those described under Alternative 1. No adverse effects to utilities are expected under Alternative 1.

No Action Alternative

The No-Action Alternative would not construct the Solar PV System and would therefore not meet the goals or objectives identified by Fort Jackson to implement the energy resiliency project. Minor, long-term adverse effects would result from the inability to meet the 14-day critical load requirement for installation self-sufficiency in contingency operations.

3.12.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

The Natural Gas Generator Units installed under Alternative 1 would meet the 100% critical load requirement to sustain all Fort Jackson's training missions and associated critical facilities as the primary generating asset for contingency operations. Short-term adverse impacts may occur during construction of the COA 3 natural gas pipeline due to temporary gas shut-offs required for utilities tie-in. Utility location methods utilizing ground penetrating radar and existing Fort Jackson utility maps would reduce potential construction-associated impacts to utility systems associated with potable water, solid waste, or stormwater systems. No adverse impacts are expected to potable water, solid waste, or stormwater utility systems. Long-term beneficial impacts to the existing infrastructure would result by providing expanded services to meet the increased needs in both daily, and contingency operations.

Alternative 2 – COA 4

Impacts under Natural Gas Generator Units Alternative 2 would be the same as those described under Alternative 1. No adverse effects to utilities are expected under Alternative 2.

No Action Alternative

The No-Action Alternative would not construct the Natural Gas Generator Units and would therefore not meet the goals or objectives identified by Fort Jackson to implement the energy resiliency project. Minor, long-term adverse effects would result from the inability to meet the 14-day critical load requirement for installation self-sufficiency in contingency operations.

3.13 WATER RESOURCES

3.13.1 Affected Environment

3.13.1.1 Surface Waters

Fort Jackson lies within the boundaries of the Congaree River and the Wateree River basins in the City of Columbia. Surface water features on the Base consist of wetlands, ponds, lakes, and perennial and intermittent streams. Streams are typical of those found in the Coastal Plain

Province. The surface pattern is linear branching and streams occupy relatively broad valleys with gentle regional gradients to the south and southeast. All streams leaving Fort Jackson flow into either the Wateree River or the Congaree River. The confluence of these rivers, approximately 16 miles southeast, forms the Santee River which continues in a south-easterly direction, eventually emptying into the Atlantic Ocean south of Georgetown, South Carolina.

There are five surface water drainage systems. All the streams present on the eastern half of the reservation flow into Colonels Creek, a major tributary of the Wateree River, which flows south eastward across the installation. The other major surface water drainage system, Gills Creek, flows slightly south-westerly across the north-western quarter of the installation. After leaving the installation, Gills Creek flows south through a series of lakes and is joined by Wildcat Creek prior to reaching the Congaree River. Wildcat Creek drains the major portion of the cantonment area. The southern part of the Installation is drained by the upper reaches of Cedar Creek and Mill Creek.

There are a total of 25 lakes, ponds, and impoundments located on Fort Jackson. Lakes and streams are primarily groundwater fed, since virtually no water drains onto Fort Jackson. These water bodies range in size from 0.5 acres to 173 acres, with most less than 35 acres in size. Together these waterbodies cover approximately 427 acres. Seven of these ponds are adequate for fisheries management (Old Heises Pond, Upper Legion Lake, Big Twin Lake, South Pond, Upper Barstow Pond, Lower Barstow Pond, and Odom Pond), while the remaining lakes and ponds are maintained for waterfowl habitat, recreation, aesthetics, and irrigation water supply for golf courses.

Weston Lake is located north of Leesburg Road and east of the cantonment area, with a surface area of approximately 173 acres. It is the largest lake, accounting for over one-third of the total surface impoundment acreage, and also serves as the primary waterside recreation lake with camping facilities, picnic shelters, community house, and beach pavilion.

Various activities may contribute sediment and other nonpoint source pollutants to nearby water bodies through stormwater runoff. Runoff from training areas may carry sediments, vehicle fluids, and metals (e.g., lead), as well as phosphorus and toxics contained within munitions. Runoff may also contain nonpoint source pollution, such as pesticides, fertilizers, animal waste, oil, and grease. Silvicultural activities may disturb the soil surface and can potentially affect surface water quality. Runoff from areas that have been harvested for timber may contain sediment and large organic debris.

COA 1, TDC-1

The footprints for COA 1 and TDC-1 do not contain surface water features (**Figure 3-6, Figure 3-7**). The closest surface water feature to COA 1 is an unnamed tributary to Gills Creek, approximately 300 feet to the south. The closest surface water feature to TDC-1 is Bynum Creek, approximately 150 feet to the north of the northeastern project area.

COA 1, TDC-2

The footprints for COA 1 and TDC-2 do not contain surface water features (**Figure 3-6, Figure 3-7**). The closest surface water feature to COA 1 is an unnamed tributary to Gills Creek, approximately 300 feet to the south. The closest surface water feature to TDC-2 is Mack Creek, approximately 150 feet to the northeast of the project area.

COA 2

The footprint for COA 2 does not contain surface water features (**Figure 3-6**). The closest surface water feature to COA 2 is a pond on the golf course west of Chesnut Road, approximately 575 feet to the southwest.

COA 3

The footprint for COA 3 does not contain surface water features (**Figure 3-6**). The closest surface water feature to COA 3 is Wildcat Creek, approximately 150 feet to the southwest. The proposed COA 3 pipeline would require crossings of Wildcat Creek (a jurisdictional stream) at two locations, just south of Lee Street and just north of Anderson Street (**Figure 3-8**)

COA 4

The footprint for COA 4 does not contain surface water features (**Figure 3-6**). The closest surface water feature to COA 4 is an unnamed tributary to Gills Creek, approximately 600 feet to the south. The proposed COA 4 pipeline would require a crossing of the unnamed tributary (a jurisdictional stream) at one location, along the Jackson Boulevard right-of-way (**Figure 3-9**).

3.13.1.2 Floodplains

Floodplains, as defined by the Federal Emergency Management Agency (FEMA), are those areas that are susceptible to being inundated by floodwaters from any source. One hundred-year floodplains have been designated along all of the major waterways on Fort Jackson. In the project areas, these include lands along Wildcat Creek, Mack Creek, and Bynum Creek. These areas are shown on the FEMA Flood Maps for Richland County (FEMA, 2023) (**Figures 3-10 through 3-13**). Development activities in regulatory floodplain areas are limited in accordance with EO Floodplain Management (EO 11988) and Protection of Wetlands (EO 11990).

COA 1, TDC-1

The footprint for COA 1 does not contain designated floodplain areas (**Figure 3-10**). The northeastern portion of the TDC-1 area contains designated 100-year floodplain areas associated with Bynum Creek (**Figure 3-11**).

COA 1, TDC-2

The footprints for COA 1 and TDC-2 do not contain designated floodplain areas (**Figure 3-10 and Figure 3-11**). A 100-year floodplain associated with Mack Creek is located adjacent to the north side of the TDC-2 project boundary.

COA 2

The footprint for COA 2 does not contain designated floodplain areas (**Figure 3-10**).

COA 3

The footprint for COA 3 contains a designated 100-year floodplain area associated with Wildcat Creek (**Figure 3-10**). Approximately 200 square feet of the 2.2-acre COA 3 parcel is located within the floodplain.

The proposed COA 3 pipeline would require crossings of Wildcat Creek at two locations, just south of Lee Street and just north of Anderson Street (**Figure 3-12**).

COA 4

The footprint for COA 4 and the proposed COA 4 pipeline do not contain designated floodplain areas (**Figure 3-10** and **Figure 3-13**).

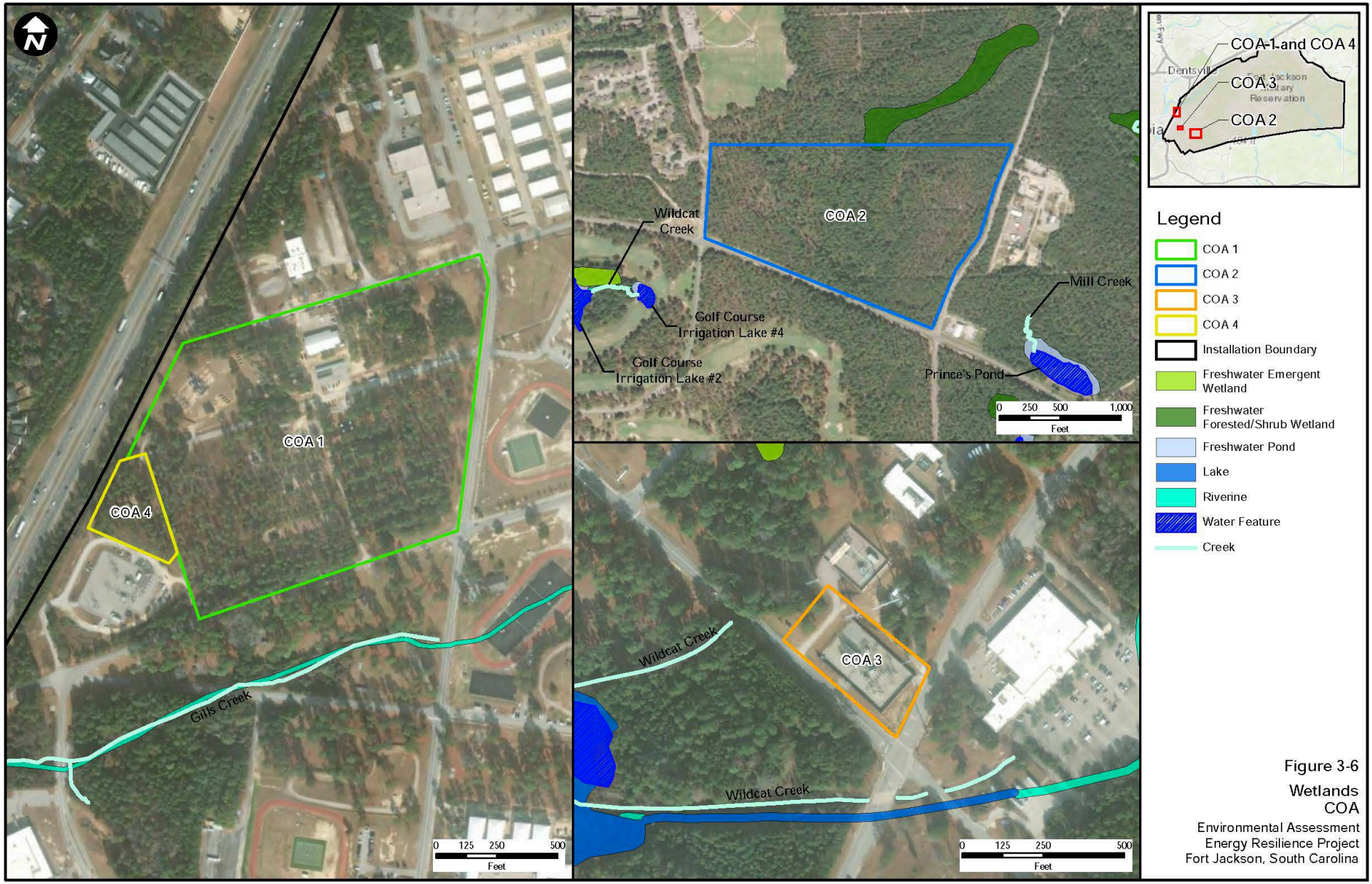

Figure 3-6
Wetlands COA
Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

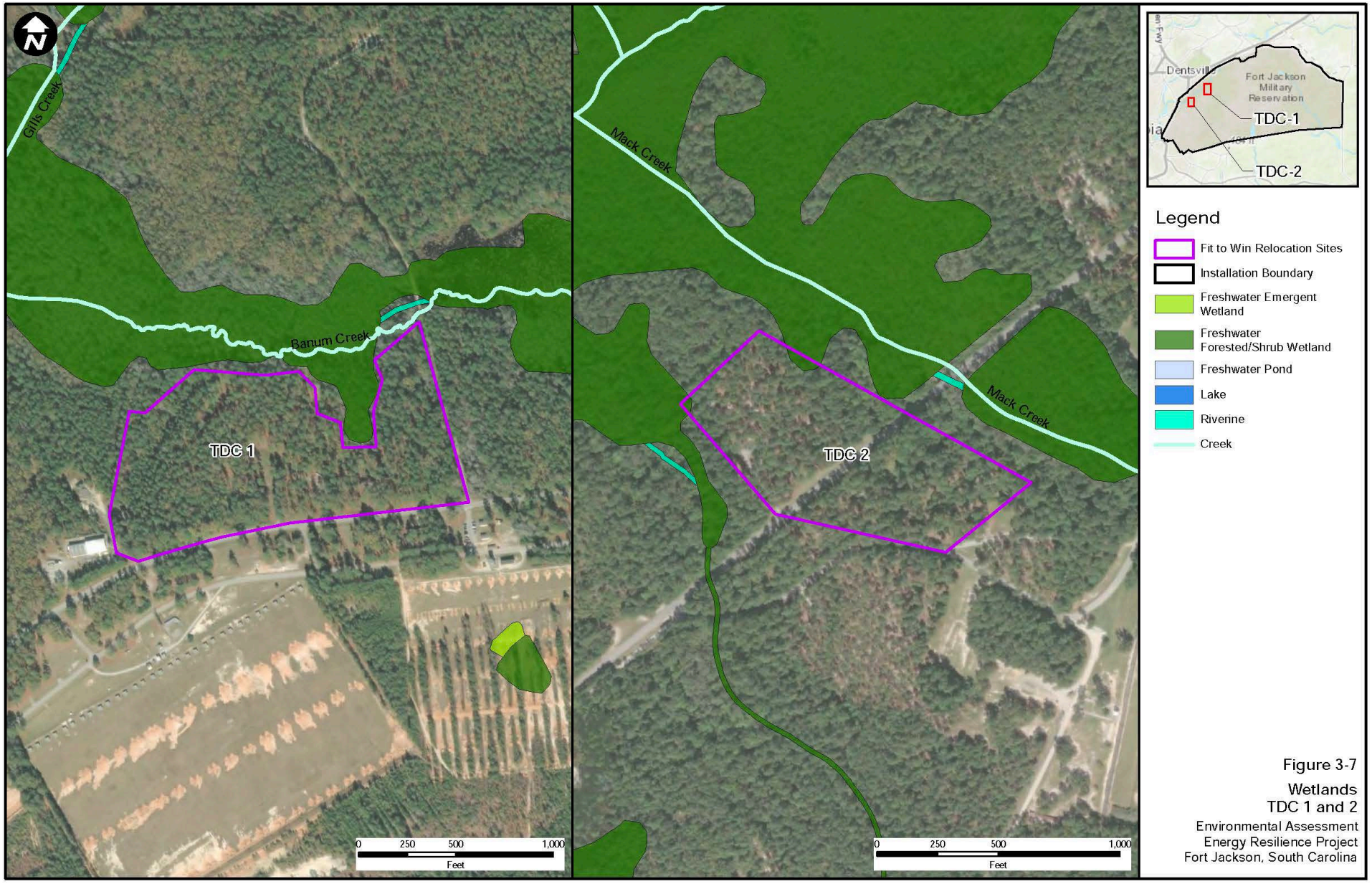

Figure 3-7
Wetlands
TDC 1 and 2
Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

Figure 3-8
Wetlands
Proposed Pipeling COA 3
Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

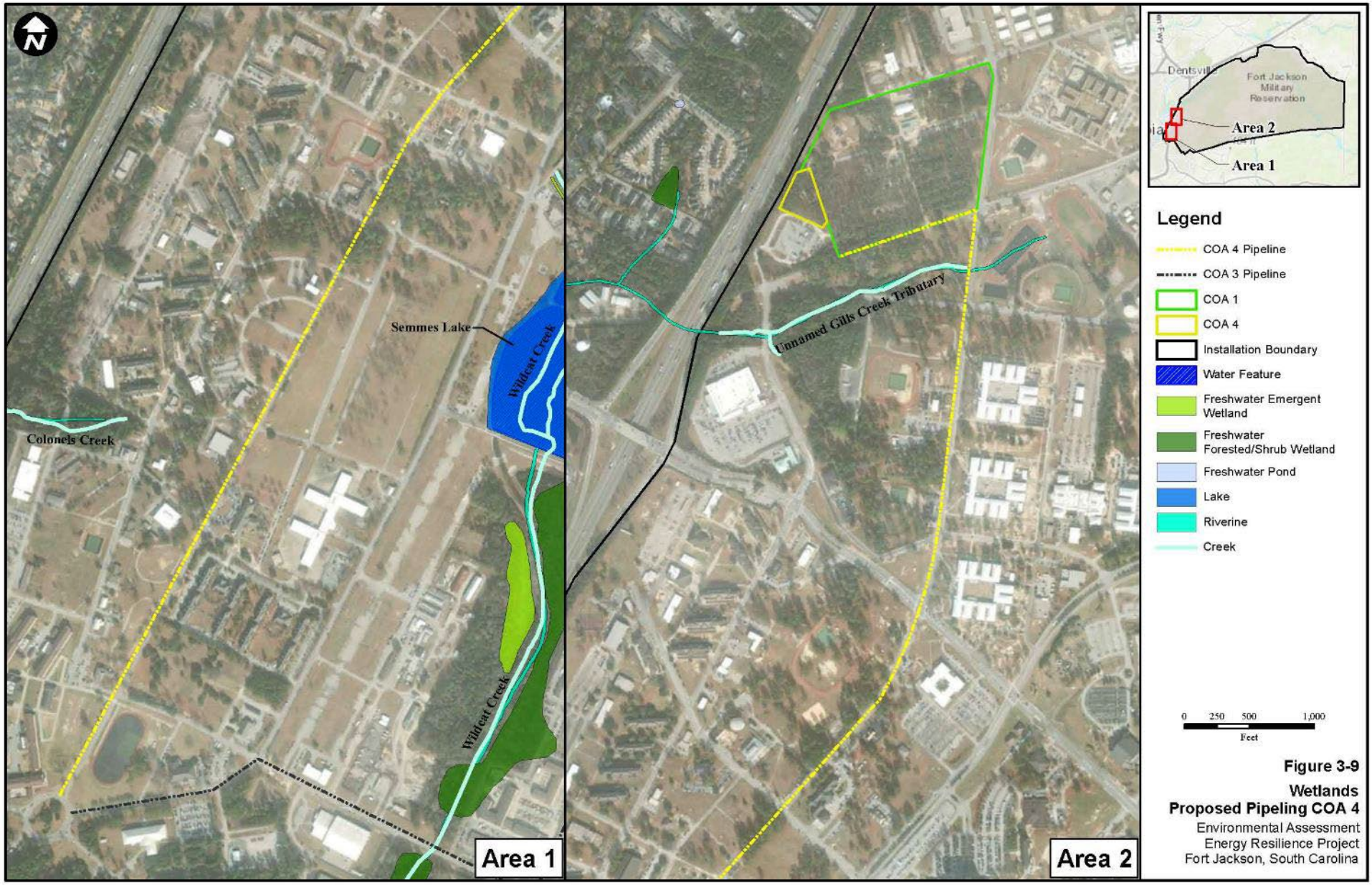

Figure 3-9
Wetlands
Proposed Pipeling COA 4
Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

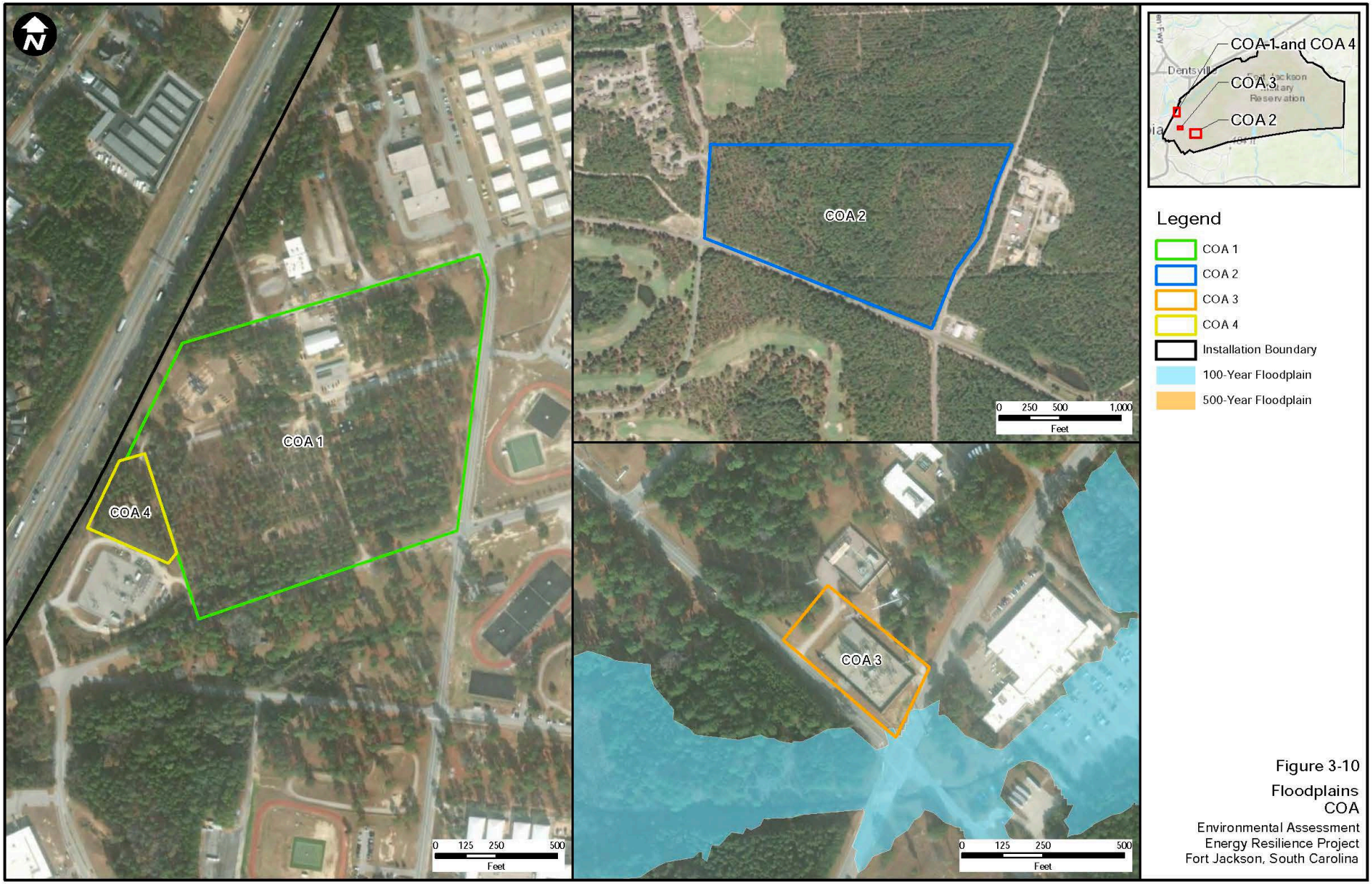

Figure 3-10
Floodplains
COA
Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

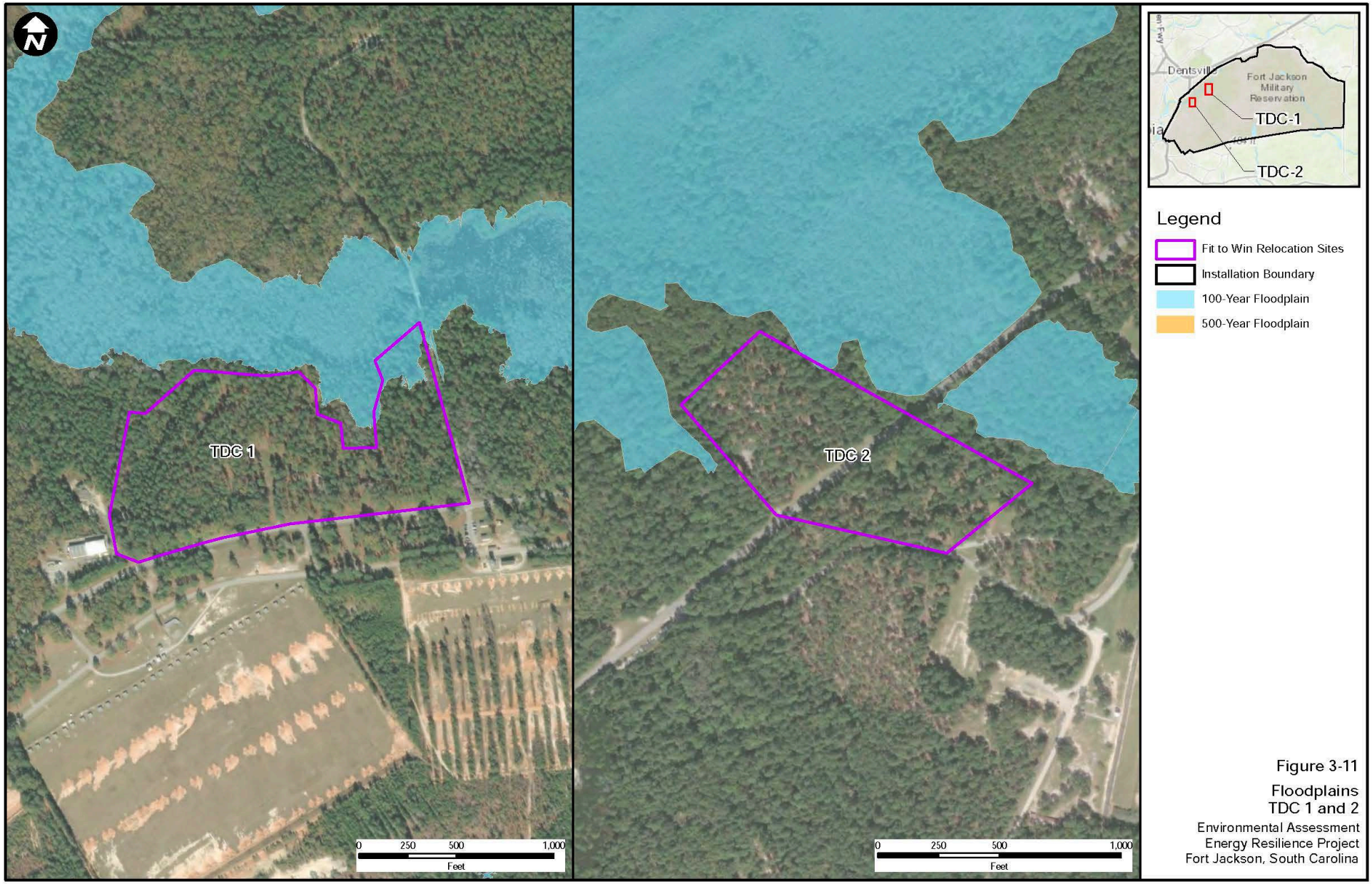

Figure 3-11

Floodplains
TDC 1 and 2

Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

Figure 3-12
Floodplains
Proposed Pipeline COA 3
Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

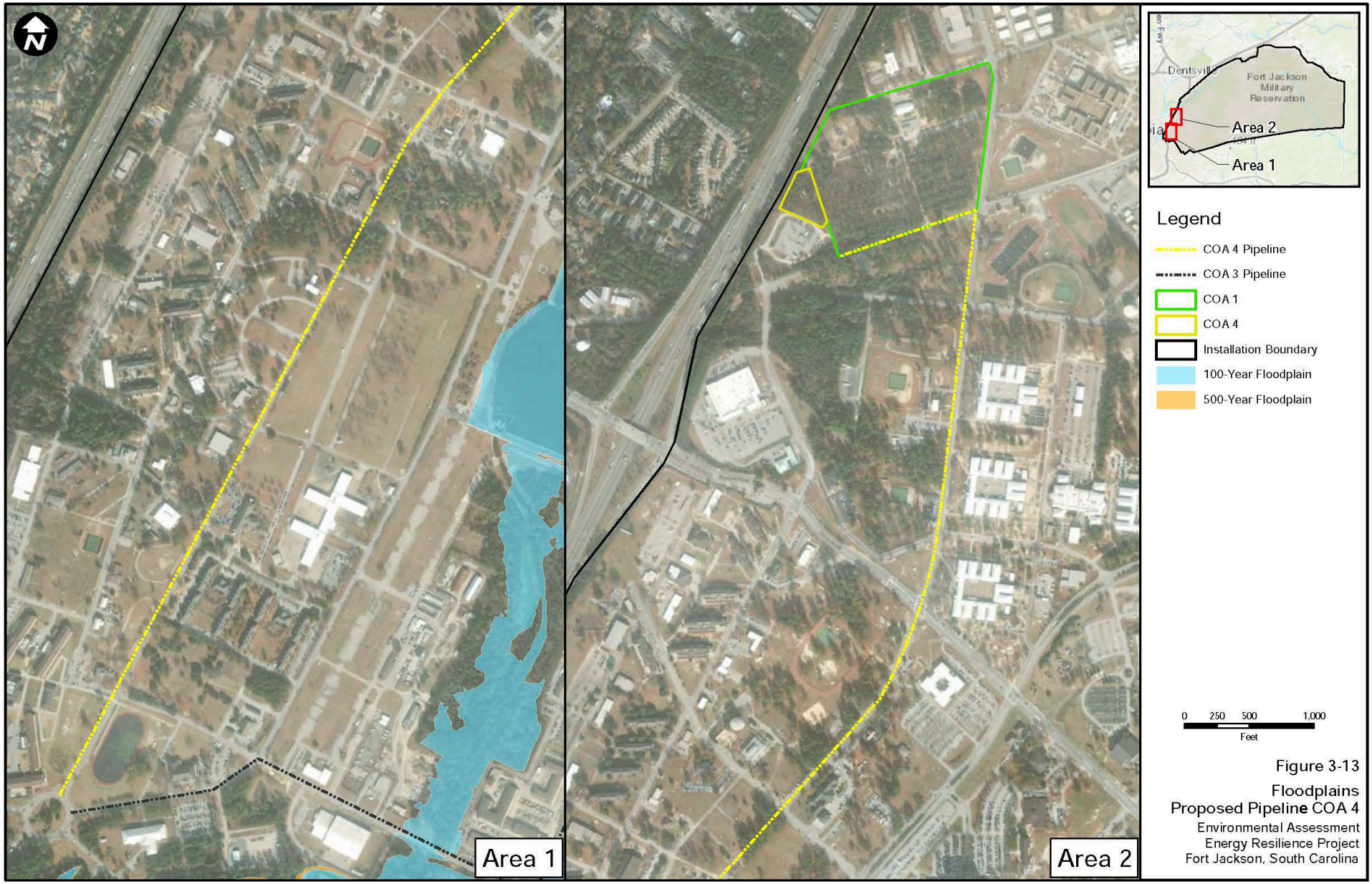

Figure 3-13
Floodplains
Proposed Pipeline COA 4
Environmental Assessment
Energy Resilience Project
Fort Jackson, South Carolina

3.13.1.3 Wetlands

There are approximately 5,250 acres of wetlands on Fort Jackson. Four aquatic and wetland vegetative communities occur on the Installation: Ponds and Lakes, Depressions, Wetland Hardwood, and Pine- Wetland Hardwood. In accordance with the Clean Water Act (CWA) Section 404(b)(1) and EO 11990, wetlands must be protected from development, silting, and other degradation. Through the NEPA review process, all soil-disturbing activities are reviewed to ensure that impacts to wetlands are avoided or minimized. Permits from the United States Army Corps of Engineers (USACE) are obtained for unavoidable impacts.

Erosion sites identified affecting wetlands in training areas receive high priority in the Installation's Land Rehabilitation and Maintenance program. Before land disturbing activities are initiated, an environmental review is conducted to ensure that wetlands will not be affected. Timber harvesting may be conducted in wetlands if operations are in accordance with applicable USACE and USEPA requirements and conditions. Any proposed cutting will be coordinated with the Forestry Branch. Wheeled or tracked vehicle maneuvers are prohibited in wetlands.

COA 1, TDC-1

The footprints for COA 1 and TDC-1 do not contain wetlands (**Figure 3-6 and Figure 3-7**). The northeastern portion of TDC-1 is adjacent to forested wetlands associated with Bynum Creek.

COA 1, TDC-2

The footprint for COA 1 does not contain wetlands (**Figure 3-6**). Forested wetlands associated with Mack Creek (approximately 0.16 acres) are located within the western and northwestern areas of the TDC-2 project boundary (**Figure 3-7)**.

COA 2

The footprint for COA 2 does not contain wetland areas. The National Wetlands Inventory (NWI) map (**Figure 3-6**) indicates that potential forested wetlands are located in the northern central area of COA 2. However, wetland scientists conducted a site visit to the potential NWI wetland area on August 25, 2022. During this site visit, the team looked for evidence of wetland hydrology, hydrophytic vegetation, and hydric soils (the three-parameter approach used by USACE to identify jurisdictional wetlands). No evidence of hydric soils or wetland hydrology were observed, and the plant species observed are common to both wetland and non-wetland areas. Based on these observations, the area does not meet the criteria to be a jurisdictional wetland.

COA 3

The footprint for COA 3 does not contain wetlands (**Figure 3-6**).

The proposed COA 3 pipeline would not cross wetlands but would require crossings of Wildcat Creek (a jurisdictional stream) at two locations, just south of Lee Street and just north of Anderson Street (**Figure 3-8**).

COA 4

The footprint for COA 4 does not contain wetlands (**Figure 3-6**).

The proposed COA 4 pipeline would not cross wetlands but would require a crossing of Gills Creek (a jurisdictional stream) at one location, along the Jackson Boulevard right-of-way (**Figure 3-9**).

3.13.2 Environmental Consequences

Each of the proposed alternatives would comply with the CWA, EO 11988, and EO 11990. Project design, along with avoidance, minimization, and mitigation measures (AMMs), in concert with construction BMPs, would be implemented to appropriately address potential impacts to surface waters, floodplains, and wetlands. The installation would adhere to AMMs and BMPs to limit impacts and manage erosion and sedimentation resulting from ground disturbance. Site designs would also incorporate the required storm water controls and management for local water quality and stormwater management compliance, in addition to the adherence to required state and local permit conditions. Erosion sites identified with the potential to affect wetlands receive high priority in the Installation's Land Rehabilitation and Maintenance program. Before land disturbing activities are initiated, an environmental review would be conducted to ensure that wetlands will not be affected. Project areas would be re-vegetated as quickly as possible upon completion of construction activities to assist with limiting potential soil erosion and sediment transport to surface waters or wetlands. Further, the selection of the project areas and designs for the alternatives have been developed to avoid surface waters, floodplains, and wetlands to the maximum extent practicable, and would not have potential long term impacts to these resources or result in the loss of wetlands, floodplains, or surface waters, as discussed below.

3.13.2.1 Solar PV System

Alternative 1 – COA 1, TDC-1

Surface Waters

The footprints for COA 1 and TDC-1 do not contain surface water features (**Figure 3-6 and Figure 3-7**). The closest surface water feature to COA 1 is an unnamed tributary to Gills Creek, approximately 300 feet to the south. The closest surface water feature to TDC-1 is Bynum Creek, approximately 150 feet to the north of the northeastern project area. This alternative would not result in direct impacts to the unnamed tributary or Bynum Creek. Vegetative clearing (approximately 55 acres of forested area) would occur as a result of solar array construction and the relocation of the TDC course.

The potential for indirect short-term adverse indirect impacts on water resources could occur during construction as a result of land-clearing activities. With construction projects there is potential for sediment, dust, oils, and other contaminants to impact construction stormwater runoff, adjacent surface waters, and water quality. The construction associated with earth-disturbing activities would be minimized to the maximum extent practicable and would comply with appropriate local, state, and Federal regulations and permits. Implementation of construction stormwater management plans and proper BMPs during construction would mitigate impacts to surface waters and water quality.

There would be no adverse impacts to surface waters from the operation of the Solar PV facilities or the relocated TDC course because no direct actions affecting surface waters would occur. The solar panels are impervious surfaces, but because of their placement on or over existing pervious

surfaces, there would be no net increase in water runoff to surface waters. There could be a slight increase in impervious surface area from parking areas, driveways, TDC activity areas, and Solar PV array infrastructure, but this additional impervious area would not be significant. Where possible, cleared areas would be re-vegetated as quickly as possible upon completion of construction activities to assist with limiting soil erosion and sediment transport to nearby surface waters.

Floodplains

The footprint for COA 1 does not contain designated floodplain areas (**Figure 3-10**). The northeastern portion of the TDC-1 area contains designated 100-year floodplain areas associated with Bynum Creek (**Figure 3-11)**. Approximately 1.5 acres of the 29-acre TDC-1 parcel is located within the floodplain. No ground disturbing activities would occur within the floodplain area during construction of the new TDC course. By avoiding the floodplain area on parcel TDC-1, this alternative would not result in direct or indirect impacts to the Bynum Creek floodplain.

Wetlands

The footprints for COA 1 and TDC-1 do not contain wetlands. The northeastern portion of TDC-1 is adjacent to forested wetlands associated with Bynum Creek. No direct impacts to wetlands are expected, and a USACE Section 404 permit would not be required. The potential for short-term adverse indirect impacts to wetlands could occur during construction as a result of land-clearing activities and construction. However, AMMs and BMPs to limit impacts and manage erosion and sedimentation, including required storm water controls and management, are anticipated to avoid, minimize, or mitigate the potential for impacts. The construction associated with earth-disturbing activities would be minimized to the maximum extent practicable and would comply with appropriate local, state, and Federal regulations and permit conditions. Implementation of construction stormwater management plans and proper BMPs during construction would prevent impacts to adjacent wetlands.

Alternative 2 – COA 1, TDC-2

Surface Waters

Similar to the impacts for Alternative 1, the footprints for COA 1 and TDC-2 do not contain surface water features. This alternative would not result in direct impacts to Mack Creek or Bynum Creek. Vegetative clearing (approximately 41 acres of forested area) would occur as a result of Solar PV array construction and the relocation of the TDC course. Proposed impacts to surface waters would be the same as for those described for Alternative 1 (negligible short-term indirect impacts for construction, and no long-term impacts from increases in permanent impervious area).

Floodplains

The footprints for COA 1 and TDC-2 do not contain designated floodplain areas (**Figure 3-10 and Figure 3-11**). A 100-year floodplain associated with Mack Creek is located adjacent to the north side of the TDC-2 project boundary, but the proposed construction of the new TDC course would not result in direct or indirect impacts to the Mack Creek floodplain.

Wetlands

The footprint for COA 1 does not contain wetlands. Forested wetlands associated with Mack Creek (approximately 0.16 acres) are located within the western and northwestern areas of the TDC-2 project boundary. However, the proposed TDC course will be designed to avoid the wetlands in these areas. No direct impacts to wetlands are expected, and a USACE Section 404 permit would not be required. The potential for short-term adverse indirect impacts to wetlands could occur during construction However, AMMs and BMPs to limit impacts and manage erosion and sedimentation, including required storm water controls and management, are anticipated to avoid, minimize, or mitigate the potential for impacts. The construction associated with earth-disturbing activities would be minimized to the maximum extent practicable and would comply with appropriate local, state, and Federal regulations and permits. Implementation of construction stormwater management plans and proper BMPs during construction would prevent impacts to adjacent wetlands.

Alternative 3 – COA 2

Surface Waters

The footprint for COA 2 does not contain surface water features. This alternative would not result in direct impacts to nearby surface waters. Vegetative clearing (approximately 60.3 acres of forested area) would occur as a result of Solar PV array construction.

The potential for indirect short-term adverse indirect impacts on water resources could occur during construction as a result of land-clearing activities. With construction projects there is potential for sediment, dust, oils, and other contaminants to impact construction stormwater runoff, adjacent surface waters, and water quality. The construction associated with earth-disturbing activities would be minimized to the maximum extent practicable and would comply with appropriate local, state, and Federal regulations and permits. Implementation of construction stormwater management plans and proper BMPs during construction would mitigate impacts to surface waters and water quality.

There would be no adverse impacts to surface waters from the operation of the Solar PV facilities, because no direct actions affecting surface waters would occur. The solar panels are impervious surfaces, but because of their placement on or over existing pervious surfaces, there would be no net increase in water runoff to surface waters. There could be a slight increase in impervious surface area from parking areas, driveways, and Solar PV array infrastructure, but this additional impervious area would not be significant. Where possible, cleared areas would be re-vegetated as quickly as possible upon completion of construction activities to assist with limiting soil erosion and sediment transport to nearby surface waters.

Floodplains

The footprint for COA 2 does not contain designated floodplain areas (**Figure 3-10**). This alternative would not result in direct or indirect impacts to designated floodplains.

Wetlands

The footprint for COA 2 does not contain wetland areas (**Figure 3-10**). This alternative would not result in direct or indirect impacts to wetlands.

No Action Alternative

Under the No Action Alternative, there would be no change in infrastructure or impervious surfaces resulting from construction or expansion of new facilities, as the proposed resilience projects would not be constructed. The No Action Alternative would not impact surface waters, floodplains, or wetlands.

3.13.2.2 Natural Gas Generator Units

Alternative 1 – COA 3

Surface Waters

The footprint for COA 3 does not contain surface water features. The proposed COA 3 location is the site of an existing substation that would be dismantled as part of a separate project. Construction of the proposed natural gas generator system and its related infrastructure would create a maximum of approximately 2.2 acres of impervious area. The proposed COA 3 pipeline would require crossings of Wildcat Creek (a jurisdictional stream) at two locations, just south of Lee Street and just north of Anderson Street. It is expected that these crossings would be constructed with directional drilling technologies or jack-and-bore systems to allow for placement of the natural gas pipeline beneath Wildcat Creek without disturbing the stream.

Direct and indirect short-term adverse indirect impacts on water resources could occur during construction as a result of land-clearing activities and pipeline installation. With construction projects there is potential for sediment, dust, oils, and other contaminants to impact construction stormwater runoff, adjacent surface waters, and water quality. The construction associated with earth-disturbing activities would be minimized to the maximum extent practicable and would comply with appropriate local, state, and Federal regulations and permits. Implementation of construction stormwater management plans and proper BMPs during construction would mitigate impacts to surface waters and water quality. Stream crossings constructed with directional drill/jack-and-bore would eliminate direct impacts to the streams.

Increases to impervious surfaces for building footprints and paved surfaces can also affect stormwater runoff quantities, surface waters, and water quality. The construction of COA 3 would not result in a significant increase of impervious surface. The area where the natural gas generator system would be constructed is currently a semi-pervious substation with impervious parking and driveway. There could be a slight increase in impervious surface area from building footprints, roof drainage, parking areas, driveways, and other infrastructure, but this additional impervious area would not be significant. Where possible, cleared areas would be re-vegetated as quickly as possible upon completion of construction activities to assist with limiting soil erosion and sediment transport to nearby surface waters.

Floodplains

The footprint for COA 3 contains a designated 100-year floodplain area associated with Wildcat Creek (**Figure 3-10**). Approximately 200 square feet of the 2.2-acre COA 3 parcel is located within the floodplain. No ground disturbing activities would occur within the floodplain area during construction of the proposed natural gas generator unit, as the area within the floodplain is within the Hill Street Road right-of-way.

The proposed COA 3 pipeline would require crossings of Wildcat Creek at two locations, just south of Lee Street and just north of Anderson Street (**Figure 3-12**). It is expected that these crossings would be constructed with directional drilling technologies or jack-and-bore systems to allow for placement of the natural gas pipeline beneath Wildcat Creek without disturbing the stream. Impacts to the floodplain would be temporary and limited to the time necessary to construct the pipeline. After construction, any disturbance within the floodplain would be regraded to the previous ground surface contours. No long-term impacts to floodplains would occur. This alternative would result in short term, direct, and negligible adverse effects to the Wildcat Creek floodplain.

Wetlands

The footprint for COA 3 does not contain wetlands. The proposed COA 3 pipeline would require crossings of Wildcat Creek (a jurisdictional stream) at two locations, just south of Lee Street and just north of Anderson Street. No wetlands are located along the proposed pipeline route. It is expected that these crossings would be constructed with directional drilling technologies or jack-and-bore systems to allow for placement of the natural gas pipeline beneath Wildcat Creek without disturbing the stream. No direct impacts to wetlands are expected, and a USACE Section 404 permit should not be required if the stream bed and banks are not disturbed. This alternative would not result in direct or indirect impacts to wetlands.

Alternative 2 – COA 4

Surface Waters

The footprint for COA 4 does not contain surface water features. Vegetative clearing (approximately 2.1 acres of forested area) would be required, and the natural gas generation system and its related infrastructure would create a maximum of approximately 2.1 acres of impervious area. The proposed COA 4 pipeline would require a crossing of Gills Creek (a jurisdictional stream) at one location, along the Jackson Boulevard right-of-way. It is expected that this crossing would be constructed with directional drilling technologies or jack-and-bore systems to allow for placement of the natural gas pipeline beneath Gills Creek without disturbing the stream.

Direct and indirect short-term adverse indirect impacts on water resources could occur during construction as a result of land-clearing activities and pipeline installation. With construction projects there is potential for sediment, dust, oils, and other contaminants to impact construction stormwater runoff, adjacent surface waters, and water quality. The construction associated with earth-disturbing activities would be minimized to the maximum extent practicable and would comply with appropriate local, state, and Federal regulations and permits. Implementation of construction stormwater management plans and proper BMPs during construction would mitigate impacts to surface waters and water quality. Stream crossings constructed with directional drill/jack-and-bore would eliminate direct impacts to the streams.

Increases to impervious surfaces for building footprints and paved surfaces can also affect stormwater runoff quantities, surface waters, and water quality. The construction of COA 4 would result in a negligible increase in impervious surface. There would be a slight increase in impervious surface area from building footprints, roof drainage, parking areas, driveways, and other infrastructure, but this additional impervious area would be negligible. Where possible,

cleared areas would be re-vegetated as quickly as possible upon completion of construction activities to assist with limiting soil erosion and sediment transport to nearby surface waters.

Floodplains

The footprint for COA 4 and the proposed COA 4 pipeline do not contain designated floodplain areas (**Figure 3-10** and **Figure 3-13**). This alternative would not result in direct or indirect impacts to designated floodplains.

Wetlands

The footprint for COA 4 does not contain wetlands. The proposed COA 4 pipeline would require a crossing of Gills Creek (a jurisdictional stream) at one location, along the Jackson Boulevard right-of-way. No wetlands are located along the proposed pipeline route. It is expected that this crossing would be constructed with directional drilling technologies or jack-and-bore systems to allow for placement of the natural gas pipeline beneath Gills Creek without disturbing the stream. No direct impacts to wetlands are expected, and a USACE Section 404 permit should not be required if the stream bed and banks are not disturbed. This alternative would not result in direct or indirect impacts to wetlands.

No Action Alternative

Under the No Action Alternative, there would be no change in infrastructure or impervious surfaces resulting from construction or expansion of new facilities, as the proposed resilience projects would not be constructed. The No Action Alternative would not impact surface waters, floodplains, or wetlands.

4.0 CUMULATIVE IMPACTS

This section describes the approach used to analyze potential cumulative impacts associated with the Proposed Action and all the remaining non-selected proposed construction and demolition projects in the context of potential interactions with other past, present, and reasonably foreseeable actions in the region.

The CEQ regulations implementing NEPA (40 CFR 1508.1) dictate that cumulative impacts analyses should be limited to the impacts that can be evaluated meaningfully by the decision-makers. The guidelines further indicate that the area to use in defining the cumulative impacts geographical boundary should extend to the point at which the resource is no longer affected significantly.

Cumulative impacts refer to the adverse effect on resources in a region when the incremental impacts of proposed projects combine with the environmental impacts of past, present, and foreseeable actions. Actions that are similar to the proposed projects or affect similar environmental resources, are located nearby, and have occurred, are ongoing, or are foreseeable can contribute to cumulative impacts. To be considered cumulative, these impacts must be related in space and time. The analysis of cumulative impacts in this EA follows CEQ and Army guidance and provides a systematic approach for assessing cumulative impacts. The analysis period for the Proposed Action and non-selected projects is approximately 5 years. Potential cumulative effects are limited to the boundaries of Fort Jackson. No interaction effects are anticipated beyond incremental short-term additions to regional air emissions, incremental changes in impervious surfaces within shared watersheds, and incremental loss of vegetative communities and wildlife habitat.

4.1 IDENTIFIED PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Past activities are the activities and actions that have occurred within the geographic scope of the cumulative effects analysis and shaped the current environmental conditions of the project area. The effects of these past activities and actions are now part of the existing environment and are included in the description of the affected environment. Reasonably foreseeable actions are those that have been planned and could be completed within the timeframe of projects addressed in this EA.

4.1.1 Past Actions

Weston Lake Dam Repairs

Ongoing embankment seepage and the potential loss of highly erodible soils in the earthen spillway during large flood events compromised the structural integrity of Weston Lake Dam at Fort Jackson. Fort Jackson then proposed to improve the Weston Lake Dam embankment and spillway to improve the integrity of the structure. A short length toe berm was constructed over and below the existing embankment with a toe drain collection system, and the emergency spillway was armored. The project was completed in 2022 following the issuance of a FONSI in 2020.

Replacement of Semmes Lake Dam

Fort Jackson proposed to rebuild the Semmes Lake Dam that was damaged in 2015 flooding. The dam was proposed to be an earthen embankment constructed to current dam safety standards. The proposed dam would have a top elevation of 224.5 feet above mean sea level and a top width of 48 feet, with the upstream face of the dam would be protected by rip-rap. The spillway for the dam would be moved to the western end of the dam and would be constructed as a labyrinth weir. Construction was completed in 2021 following the issuance of a FONSI in 2015.

Upper and Lower Legion Lakes Repairs

Fort Jackson proposed to make repairs to the Upper Legion Lake dame and permanent repairs to replace the temporary emergency repairs to the Lower Legion Lake dike. The action was intended to bring the stormwater detention capacity to its pre-2015 levels. Repairs to the lake stabilized the temporary outlet structure to improve the stability of the dike. A FONSI was issued for the Proposed Action in 2017.

4.1.2 Present and Reasonably Foreseeable Future Actions

Present Actions

The ongoing Reception Complex renovations involve demolition and construction along Anderson Street on Fort Jackson. Construction includes a new Dining Facilities Administration Center and a Clothing Initial Issue Point facility. Building 1895 has been planned for demolition.

The construction of Basic Combat Training 4 (BCT 4) Phase Two, located between Hampton Parkway and Jenkins Road, is currently ongoing. Phase Two includes the construction of three Trainee Barracks.

Foreseeable Future Actions

The purpose of the proposed Fort Jackson Area Development Plans is to sustain and adapt the military mission requirements at Fort Jackson through development of three distinct districts. The Victory District is the point of transition for Trainees and families. The District reflects Fort Jackson's heritage, tradition, and character by establishing welcoming landmarks and celebrating public open spaces. The Semmes District is one of the primary soldier and community support areas on Fort Jackson, largely by troop barracks, battalion headquarters, troop and community support organizations, and Army Training units. The Palmetto District is one of the largest, occupied by open space, recreational facilities, and natural. It also contains Twin Lakes Recreation Area, Fort Jackson Golf Club, and Hilton Field. Additional green spaces are interspersed throughout, used in part for training. The Villages District is one of the primary Soldier and community support areas, consisting primarily of Family housing. It also includes Pierce Terrace Elementary School, CDCs, and numerous community-gathering spaces. The District borders Semmes District, with all its services and amenities, and the Palmetto District with vast recreational opportunities. Palmetto and Villages Districts were combined into one comprehensive ADP due to their proximity and their similar nature. The Proposed Action would construct various facilities across Fort Jackson. Land, equipment, and facilities support direct mission activities, as well as the housing and general living needs of its residents. Improvements would comply with the AR 210-20, *Real Property Master Planning for Army Installations*.

The U.S. Army Reserves 81st Readiness Division will be executing a project in FY2024 for the construction and operation of a Military Equipment Parking area for a new equipment fielding facility. The site is located off of Ewell Road on a 14-acre parcel. The existing forest stands will be removed, and four structures will be demolished. Six acres of stormwater management features will be constructed to offset any potential increases in stormwater runoff.

The South Carolina Army National Guard/McCrady Training Center are proposing to construct a new Multi-Purpose Machine Gun range. The approximately 168-acre range would be located off Wildcat Road, in the vicinity of and overlapping the current Main Tank Range. Construction includes all Range Operations and Control Area structures, parking, access roads, required utilities, a new potable well, and septic system. Construction is forecasted to start in March 2024.

The construction of a new CDC at the intersection of Lee Road/Semmes Road is planned for FY2030, however recent proposals from the Fort Jackson DPW Master Planning Division are calling to move up the project start date to FY2027.

4.2 CUMULATIVE IMPACTS TO RESOURCE AREAS

The potential for other past, present, and reasonably foreseeable future actions to interact with the Proposed Action to create cumulative effects varies among resource areas. Considered projects are discussed for each resource area with a potential for cumulative impacts. Projects with no potential to interact are not discussed for these resource areas.

4.2.1 Air Quality

The demolition and construction activities associated with the Proposed Action would generate air pollutant emissions from site-disturbing activities and from the operation of construction and demolition equipment. There is potential for fugitive dust emissions; however personnel would implement proper BMPs to reduce the likelihood of impacts. Short-term increases in air emissions are expected during the demolition and construction phases of the Proposed Action; however, these effects would result in no significant cumulative impacts to air quality.

No long-term increases in emissions would occur from the proposed Solar PV System; however long-term increases in air emissions are expected due to the operation of the Natural Gas Generator Units. Emissions from both Proposed Actions are anticipated to have a negligible cumulative indirect impact on air quality when compared to insignificant indicator values.

All present and reasonably foreseeable future construction projects have the potential for temporary, adverse effects on air quality due emissions from construction equipment. Air quality impacts associated with the Proposed Action would be cumulative with any other construction activity on the installation. However, construction activity would comply with appropriate local, state and federal environmental regulations and permits to minimize adverse air quality impacts. Further, air emission model results showed that the applicable NEPA impact indicators for criteria pollutants would not be exceeded under the Proposed Action.

When combined with the potential impacts from the present and reasonably foreseeable future actions, the cumulative impacts to air quality would be long-term. Continuous construction projects at Fort Jackson would result in an overall decrease in air quality, however given the installation-wide implementation of BMPs, this impact is anticipated to be minor.

4.2.2 Climate Change

Temporary, short-term adverse climate change impacts would be expected as a result of vehicle exhaust from construction vehicles and equipment under both Proposed Actions. Developments would involve tree clearing, resulting in less natural carbon sequestration. When combined with the potential impacts from the present and reasonably foreseeable future actions, the cumulative impacts of operating the Solar PV System could result in long-term beneficial impacts to overall GHG emissions at Fort Jackson and within the region due to less consumption of fossil fuels. However, development of past, present and reasonably foreseeable future actions have and will contribute to an overall increase in GHG emissions.

4.2.3 Noise

The Proposed Action is anticipated to only result in a noise level increase during the construction and demolition activities associated with the development process. The noise level increase during development would be short-term and temporary. Elevated noise levels are expected during operation of the Natural Gas Generator Units. The noise would not be out of character with existing noise in the area and would be naturally attenuated by existing vegetation. The assumed generators for this project are designed to have low vibration and limited noise emissions outside of their enclosures. Generators would include noise control measures and comply with installation and local noise emission standards. Impacts associated with the operation of Proposed Action components would therefore be long-term and negligible.

Combined with the potential impacts from the present and reasonably foreseeable future actions, cumulative impacts associated with any increases of vehicle traffic would be negligible given the existing noise environment. The respective past, current and future projects reviewed for the cumulative effects evaluation were not individually significant contributors to the overall noise environment. The respective current and future projects are separated by distance, and construction activities taking place at the same time would not cumulatively significantly change the existing noise environment. Therefore, there would be no significant cumulative impacts to the noise environment as a result of the Proposed Action or alternatives.

4.2.4 Land Use

Land use changes are anticipated under all Proposed Action alternatives except for Natural Gas Generator Unit Alternative 1. The Proposed Action is anticipated to increase the overall industrial land use at Fort Jackson. No conflicts with adjacent land uses are expected from alternatives where there would be land use changes. Combined with the potential impacts from the present and reasonably foreseeable future actions, Fort Jackson is expected to see continual and long term conversion of land to industrial uses, such as with the future Military Equipment Parking area. Considering the abundance of developable land at Fort Jackson, cumulative impacts to would be minor and long-term.

4.2.5 Biological Resources

The Proposed Action would require the clearing of forest vegetation to construct the Solar PV System and Natural Gas Generator Units. Impacts to vegetation would be minimized by only removing necessary trees and implementing construction BMPs. Vegetation removal would result

in a long term minor adverse impact to vegetation communities. There would be no significant impacts to native or landscape vegetation from the operation of the Solar PV facilities. Vegetation removal along the natural gas pipeline corridor would result in a long term negligible adverse impact to vegetation communities due to necessary development in landscaped areas containing trees, shrubs, and other vegetation. Combined with the potential impacts from the present and reasonably foreseeable future actions, the Proposed Action would be additive to the projected decrease in forested area due to conversion to industrial, recreational, and housing uses. Past actions involved dam and lake repairs. Present and future actions involve construction activities, and projects such as the Military Equipment Parking area involve tree clearing. Noise and human activity during construction from these projects would cumulatively impact vegetation and wildlife from consistent habitat alternations associated with these activities.

Construction would result in short-term negligible impacts to wildlife. During construction, any wildlife in the area likely would leave, but would be expected to relocate to adjacent forested areas. Compliance with the INRMP, which would ensure impacts to fish and wildlife would be minimal. The proposed project would have no effect to the threatened and endangered species such as the RCW or protected plants, as those species do not have suitable habitat or are not known to occur within the project area. Tree-clearing activities have the potential to affect the tricolored bat. With the appropriate construction mitigation measures, such as limiting dates where construction can take place, and not constructing at night, it would be expected that this alternative "May Affect, Not Likely to Adversely Affect" the tricolored bat.

4.2.6 Cultural Resources

The areas proposed for development under the Proposed Action are located within Fort Jackson's cantonment area, with the exception of TDC-1 and TDC-2. Previously disturbed areas within the cantonment area do not require an archaeological survey. No NRHP-eligible historical or archaeological resources have been identified in the area of TDC-1 or TDC-2.

Buildings 2335, 2495, and 4500 were analyzed in this EA. Other NHRP-listed structures have either been demolished (Buildings 1520 and 2511), or are planned for demolition in the near future (Building 1895), and were therefore not analyzed in this EA. A Section 106 agreement document and associated mitigation actions or products are being developed for Building 1895 to address the adverse effect of demolition. Building 2335 is located within close proximity to the COA 4 pipeline, however development activities would not disturb the structure, footprint, or viewshed of the facility. Therefore, no impacts are expected to the historical integrity of Building 2335. Fort Jackson previously mitigated Building 2495 pursuant to Section 106 of the NHPA. All proposed development areas are at least 2,200 feet from this structure. Building 4500 is located at least 900 feet from any proposed development. All Proposed Action alternatives would have no effect on archaeological or historic resources listed or eligible for listing on the NRHP, with the exception of Solar PV System Alternative 2. Present and reasonably foreseeable future actions, combined with the Proposed Action, are not expected to impact cultural resources in the long term due to existing BMPs and continued compliance with NRHP and cultural resource protection standards.

An NRHP-eligible archaeological site is located within the boundaries of COA 2, which would be selected under Solar PV System Alternative 2. This alternative is likely to have moderate to major impacts to the NRHP-eligible resource, which could be reduced by significant mitigation to document the resource.

All present and reasonably foreseeable future construction projects have the potential to occur near sites of historical or cultural significance. However, BMPs have been, and would be implemented to protect these resources for the duration of development activities. The respective past, current and future projects reviewed for the cumulative effects evaluation were not individually significant contributors to cultural resource impacts.

4.2.7 Hazardous Materials and Waste

Hazardous materials such as fuels for equipment and vehicles would be managed in accordance with applicable military, federal, state, and local regulations. Contractors would be responsible for hazardous substance spill prevention, training, clean up, and reporting, and must comply with the Fort Jackson's Spill Prevention, Control, and Countermeasure plan. The Fort Jackson Environmental Division would be contacted if contamination is discovered, or if spills occurred during construction of various projects. Any and all contaminated debris and waste generated during the project will be disposed in accordance with SCDHEC regulations. It is unlikely that hazardous waste materials from the other relevant projects would be generated during the same time period.

Demolition activities under the current Reception Complex and BCT 4 Phase 2 project generate waste and have potential to generate hazardous waste from demolition activities. Future projects such as the Military Equipment Parking area would generate solid waste from the demolition of four structures. However, there would be no significant incremental adverse cumulative effects on hazardous materials/waste generation or disposal to local landfills from implementation of the Proposed Action based on the typical volumes generated during these activities.

4.2.8 Safety and Occupational Health

Fort Jackson requires its contractors and heavy equipment operators to adhere to all applicable safety regulations and guidelines. Direct construction and demolition adverse impacts would be negligible, localized, and short-term. No indirect impacts are expected from the Proposed Action. Development activities under the Proposed Action and present and reasonably foreseeable future actions would result in a temporary increase in traffic from vehicles and equipment. However, due to traffic control BMPs and adherence to installation safety procedures, only negligible impacts to safety would be anticipated. Once construction is completed, transportation patterns are expected to revert to pre-construction direction and frequency. Temporary negligible impacts to the traffic environment would occur. Intermittent traffic delays, detours, and temporary road closures may occur in the vicinity of the proposed developments. Potential congestion impacts could be avoided or minimized by scheduling truck deliveries outside of the peak inbound traffic time and by using different access gates. Combined with the potential impacts from the present and reasonably foreseeable future actions, no long-term or significant cumulative impacts on transportation infrastructure are anticipated from the Proposed Action.

4.2.9 Geology and Soils

Construction and demolition activities involving tree clearing, grading and site preparation activities would have direct short-term adverse impacts on physical resources. To minimize impacts, erosion and sedimentation control measures would be implemented, including the use of BMPs at the construction sites, such as silt fencing, hydro-mulching, sediment traps, and

vegetated filter strips. Proper BMPs would be implemented to reduce erosion hazards during pipeline installation, with construction activities potentially avoided within months susceptible to flooding conditions. Clearing of timber or grading around the development area would be required during construction, and result in negligible long-term impacts to topography. Combined with the potential impacts from the present and reasonably foreseeable future actions, the Proposed Action is not anticipated to contribute to cumulative effects to geologic resources. Geologic resources would remain unaffected by the Proposed Action components because there is no substantial excavation associated with this action that would impact site geology. No significant cumulative impacts to soils would be anticipated.

4.2.10 Socioeconomic Resources and Environmental Justice

The Proposed Action would result in short-term minor beneficial impacts to socioeconomics of the ROI. Beneficial impacts to the regional economy would occur as a result of hiring construction crews during the development phase and hiring skilled labor for the installation of the solar elements. Short-term beneficial impacts are expected to environmental justice from the hiring of local labor during the construction phase. These practices are also anticipated for present and reasonably foreseeable future actions. No adverse impacts to children or housing are anticipated from the proposed action, or present and reasonably foreseeable future actions. Long-term beneficial cumulative impacts to socioeconomic resources and environmental justice are expected due to the continued employment of local workers.

4.2.11 Transportation and Traffic

Temporary minor short-term impacts are anticipated due to potential reroutes or road closures associated with the proposed construction and demolition. These activities would require the temporary employment of workers, contributing to traffic. Temporary minor short-term impacts are anticipated due to potential reroutes or road closures associated with the proposed construction and demolition. Development activities under the Proposed Action and present and reasonably foreseeable future actions would result in a temporary increase in traffic from vehicles and equipment. However, due to their geographic separation, only negligible impacts to transportation would be anticipated. Construction of the natural gas pipelines would be limited in peak hours or during events to reduce the impact on traffic flow and the need for reroutes. Once construction is completed, transportation patterns are expected to revert to pre-construction direction and frequency. Combined with the potential impacts from the present and reasonably foreseeable future actions, no long-term cumulative impacts to the traffic environment are expected.

4.2.12 Utilities

Installation of the Solar PV System would replace some of the gas and electrical energy used on the installation with electricity produced by solar, thereby reducing the installation’s reliance on fossil fuels. Maintenance and improvement of infrastructure have a long-term beneficial impact on the human and natural environment through increased efficiency of operations, increase in green technologies, as well as decreased costs associated with improved systems.

Short-term adverse impacts may occur during construction of the COA 3 natural gas pipeline due to temporary gas shut-offs required for utilities tie-in. No long-term adverse impacts are expected to utility systems associated with potable water, solid waste, or stormwater systems.

Utilities work necessary under the Proposed Action would also be necessary under present and reasonably foreseeable actions at Fort Jackson. Cumulative beneficial effects area expected from the implementation of these projects. Combined with the potential impacts from the present and reasonably foreseeable future actions, long-term beneficial impacts to the existing infrastructure would result by providing expanded services to meet the increased needs in both daily, and contingency operations. No adverse cumulative effects to utilities are expected.

4.2.13 Water Resources

The potential for indirect short-term adverse indirect impacts on surface water resources could occur during construction as a result of land-clearing activities. There would be no adverse impacts to surface waters from the operation of the solar facilities or the relocated TDC course because no direct actions affecting surface waters would occur. There could be a slight increase in impervious surface area from building footprints, roof drainage, parking areas, driveways, and other infrastructure, but this additional impervious area would not be significant.

Natural Gas Generator Unit Alternative 3 would occur partially within a floodplain; however, no ground disturbing activities would occur within the floodplain area during construction of the proposed natural gas generator unit. Floodplains would also be encountered during construction of the COA 3 natural gas pipeline. Directional drilling technologies or jack-and-bore systems to allow for placement of the natural gas pipeline beneath Wildcat Creek without disturbing the stream. Impacts to the floodplain would be temporary and limited to the time necessary to construct the pipeline. All other Proposed Action alternatives would not result in potential impacts to floodplains.

There would be no direct or indirect impacts to wetlands under the Natural Gas Generator Unit alternatives. There is, however, there is potential for short-term adverse indirect impacts to wetlands during construction as a result of land-clearing activities under the Solar PV Unit alternatives. There is potential for sediment, dust, oils, and other contaminants to runoff to adjacent areas, including wetlands; however, implementation of construction stormwater management plans and proper BMPs during construction would prevent impacts to adjacent wetlands.

All construction projects under the Proposed Action and present and reasonably foreseeable actions have the potential for adverse effects on surface water quality due erosion and the transport of sediment in stormwater runoff. However, construction activity would comply with appropriate local, state, and federal environmental regulations and permits to control erosion and transportation of sediment. Several of the present and reasonably foreseeable actions would result in the increase of impervious surface, however increases are negligible relative to the large area of permeable surface at Fort Jackson.

Combined with the potential impacts from the present and reasonably foreseeable future actions, the Proposed Action is not anticipated to contribute to cumulative effects to water resources. Implementation of BMPs and installation standards would ensure potential impacts to water resources are reduced as much as practicable or eliminated altogether.

5.0 CONCLUSION

5.1 CONCLUSIONS

This EA evaluates the potential effects on the natural and human environment from the proposed construction of a Solar PV System and Natural Gas Generator Unit system. The EA examines the Proposed Action alternatives and a No Action Alternative. This EA evaluates potential long and short-term effects on Air Quality, Climate Change, Noise, Land Use, Biological Resources, Cultural Resources, Hazardous Materials and Waste, Safety and Occupational Health, Geology and Soils, Socioeconomic Resources and Environmental Justice, Transportation and Traffic, Utilities, Water Resources, and Cumulative Impacts.

It is therefore concluded that Alternative 1 for the Solar PV System (COA 1, TDC-1) and Alternative 2 for the Natural Gas Generator Units (COA 4) are the preferred actions to be implemented and are also the environmentally preferred actions. If, after public review, significant environmental impacts are not demonstrated or agreed upon, a FONSI is recommended.

The Proposed Action will not result in significant impacts on the quality of the human environment. Properly applied management directives and guidelines, compliance with applicable laws and regulations, proactive development and implementation of resource management plans, and ongoing development and operating permit requirements will collectively serve to prevent significant adverse effects on regional resources.

Implementation of Alternative 1 for the Solar PV System and Alternative 2 for the Natural Gas Generator Units would not result in significant environmental impacts, provided that BMPs to mitigate these potential environmental impacts are adhered to during construction and operation of the proposed projects. These alternatives would provide energy generation and storage needs which will allow the Army to achieve the 14-day minimum 100% critical load requirement to meet Army Directive 2020-03.

5.2 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

In order to reduce environmental impacts BMPs and mitigation measures will be used during development of any Action Alternative. These measures are outlined in **Table 5-1**. An additional NEPA analysis would be required once the project design plans are completed. The project Proponent shall submit a REC request Form to the Fort Jackson Environmental Division. The approved REC would include specific environmental and natural resource requirements for the project.

Table 5-1: BMPs and Mitigation Measures

Resource	BMPs/Mitigation Measures
Air Quality	• Consider low-emission options for all emissions-producing equipment (e.g., generators, transformers, and refrigeration units). • To suppress dust during ground-disturbing activities, cover or apply water or soil stabilizers to soil. Limit or halt soil-disturbing activities during high-wind conditions when work is in soil classified as highly erodible.

Resource	BMPs/Mitigation Measures
	• Cover soil stockpiles and trucks transporting soil or other materials that could cause airborne dust. • Use electricity from established power sources rather than generators whenever possible. • Minimize vehicle and equipment idling times.
Climate Change	• To reduce greenhouse gas emissions the following BMP will be utilized as needed; reducing fugitive dust emissions, avoiding the unnecessary idling of construction equipment; and maintaining construction equipment in good operating condition.
Noise	• Compliance with applicable laws and regulations; permits; and Army and installation programs, policies, and plans. • For all construction activities, implement the industry standard practice of operation construction equipment in accordance with the manufacturer's specifications and with standard mufflers and other noise-reducing equipment in proper operating condition. • Use equipment mufflers and/or other sound dampening devices, as appropriate. Shut down noise-generating equipment when not in use. If complaints about noise are received, increase sound-reducing measures appropriately. • Personal hearing protection by appropriate construction personnel. • Position generators, and other noise-producing equipment away from areas where quiet is important, and shield it with walls or other enclosures, as appropriate, to reduce sound transmission.
Land Use	• Compliance with applicable laws and regulations; permits; and Army and installation programs, policies, and plans.
Biological Resources	• Appropriate biological resources surveys identified and completed in time to inform site design and/or construction activities. • Site design to minimize the size of disturbed areas. • Tree clearing and night construction avoided in months where presence of the proposed endangered tricolored bat is possible. • Conduct informal or formal consultations with USFWS if any development or activities are planned in areas that support any federally listed threatened and endangered species or their habitat. • Compliance with applicable laws and regulations; permits; Army and installation programs, policies; and the INRMP.
Cultural Resources	• Complete cultural resources survey as directed by SHPO guidance received during consultations. • Compliance with applicable laws and regulations; permits; Army and installation programs, policies; the ICRMP, and the Programmatic Agreement with South Carolina SHPO.
Hazardous Materials and Waste	• Proper management and disposal of all hazardous waste generated during construction and maintenance, in compliance with applicable laws and regulations.

Resource	BMPs/Mitigation Measures
	• Use of protective gear and equipment by construction and maintenance workers to minimize potential impacts from hazardous material. • Compliance with applicable laws and regulations (including RCRA and CERCLA); permits; and Army and installation programs, policies, and plans, including the Fort Jackson Hazardous Substances Management Plan, Installation Spill Contingency Plan.
Safety and Occupational Health	• Use of protective gear and equipment by construction and maintenance workers to minimize potential health hazards and accidents and potential impacts from hazardous material. • Develop and implement comprehensive construction health and safety plan which addresses site specific health and safety issues, including specific emergency response services and procedures and evacuation measures (contractor responsibility). • If any evidence of MECs are encountered on the site during construction or operation and maintenance, cease work immediately and remain stopped until the appropriate military office has been notified and appropriate clearance procedures have been completed.
Geology and Soils	• Compliance with applicable laws and regulations; permits; and Army and installation programs, policies, and plans. • Minimize soil erosion that could result in sedimentation of surface water during ground-disturbing activities by implementing appropriate control measures, such as silt fences, inlet protection, and diversion ditches.
Socioeconomic Resources and Environmental Justice	• Fence construction sites and post appropriate signage to deter unauthorized people, including children, from accessing them.
Transportation and Traffic	• Route and schedule construction vehicles to minimize conflicts with other traffic to the maximum extent practical.
Utilities	• Project design to be compatible with existing grid system.
Water Resources	• Site design to maximize avoidance of water features and minimize the size of disturbed areas. • Site design, construction, operation, and maintenance prevents or reduces migration of contaminant (if any are warranted based on the type of contaminant) to off-site surface water or groundwater. • Erosion and storm water management control measures on the project site during construction. • Compliance with applicable laws and regulations; permits; and Army and installation programs, policies, and plans.

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APPENDIX A: PUBLIC, TRIBAL, AND AGENCY REVIEWS, COMMENTS, AND CONSULTATIONS

Tribal Government Coordination

- Absentee-Shawnee Tribe of Oklahoma
- Alabama-Quassarte Tribal Town
- Catawba Indian Nation (Catawba Indian Tribe of South Carolina)
- Chickasaw Nation (Agency)
- Eastern Band of Cherokee Indians
- Eastern Shawnee Tribe of Oklahoma
- Kialegee Tribal Town
- Muscogee (Creek) Nation of Oklahoma
- Poarch Creek Indians
- Seminole Tribe of Florida
- Shawnee Tribe
- Thlopthlocco Tribal Town
- Tuscarora Nation
- United Keetoowah Band of Cherokee Indians

Contacted Federal, State, and Local Agencies

- South Carolina State Clearinghouse
- Environmental Protection Agency, Region 4
- South Carolina Department of Health and Environmental Control (SCDHEC)
- South Carolina Department of Natural Resources
- South Carolina State Historic Preservation Office
- United States Fish and Wildlife Service, South Carolina Ecological Services
- Richland County School District

APPENDIX B: AIR QUALITY ANALYSIS

Generator Fuel Usage Calculations
Fort Jackson - Environmental Assessment

Generator No.	Fuel	Generator Output (kW)	Operation (hr/yr)	Fuel Usage (MMBtu/yr)
1	Natural Gas	25,000	336	78,874

Notes:

1. Total generator output will be 25 MW (25,000 kW). A decision regarding the number of generators that will be installed to meet this output has not been reached.
2. Generator(s) assumed to operate 24 hr/day, 14 days/yr = 336 hr/yr.
3. Generator fuel consumption calculated based on an assumed brake specific fuel consumption rate of 7,0000 Btu/hp.

Air Emission Factors
Fort Jackson - Environmental Assessment

Values for Natural Gas or Propane (LPG) -Fueled IC Engines

Pollutant	CAS	AP-42 Emission Factor (lb/MMBtu)	NSPS JJJJ Emission Factor (g/HP-hr)	NSPS JJJJ Emission Factor (lb/MMBtu)	Emission Factor Used (lb/MMBtu)
Criteria Pollutants					
CO	CO	5.57E-01	2	6.30E-01	6.30E-01
NOx	NOX	8.47E-01	4	1.26E+00	1.26E+00
PM	PM	9.99E-03			9.99E-03
PM10	PM10	9.99E-03			9.99E-03
PM2.5	PM2.5	9.99E-03			9.99E-03
SO2	SO2	5.88E-04			5.88E-04
VOC	VOC	1.18E-01	1	3.15E-01	3.15E-01
Green House Gases					
CO2	124-38-9	1.10E+02		1.17E+02	1.17E+02
Methane	74-82-8	1.25E+00		2.20E-03	2.20E-03
Nitrous Oxide	10024-97-2			2.20E-04	2.20E-04

Notes:
1. AP-42 emission factors obtained from AP-42, Section 3.2, Table 3.2-2. Values for 4-stroke lean-burn engines operating < 90% load.
2. NSPS Subpart JJJJ emission factors obtained from NSPS standards Subpart JJJJ, Table 1. Values for emergency generator.
3. All greenhouse gas emission factors from 40 CFR 98 (Mandatory GHG Reporting), Subpart C, Tables C-1 and C-2.

Generator Emission Calculations
Fort Jackson - Environmental Assessment

			Anticipated Air Emissions from Action (tons/yr)								
			Criteria Pollutants						Greenhouse Gases		
		Pollutant	Carbon Monoxide	Oxides of Nitrogen	PM10	PM2.5	Sulfur Dioxide	Volatile Organic Compounds	Carbon Dioxide	Methane	Nitrous Oxide
Generator No.	Fuel Usage (MMBtu/yr)	CAS	CO	NOX	PM10	PM2.5	SO2	VOC	124389	74828	10024972
1	78,874		24.84	49.68	3.94E-01	3.94E-01	2.32E-02	12.42	4,613	8.69E-02	8.69E-03

Air Conformity Analysis
Fort Jackson - Environmental Assessment

Pollutant	Action Emissions (tons/yr)	Insignificance Indicator	
		Indicator (tons/yr)	Exceedence?
SO2	0.02	250	No
PM10	0.39	250	No
PM2.5	0.39	250	No
CO	24.84	250	No
NOX	49.68	100	No
VOC	12.42	100	No
CO2e	4,618	75,000	No

Notes:
1. CO2e is CO2 equivalent emissions, calculated using the values presented below.

Global Warming Potential of Greenhouse Gases (GHGs)	
CO2	1
Methane	25
N2O	298

Evaluation of Insginificant Indicators
Fort Jackson - Environmental Assessment

Monitoring Location	Pollutant Design Values [1]								
	O3 (ppm)	PM2.5 Annual (ug/m3)	PM2.5 24-hour (ug/m3)	SO2 1-hour (ppb)	NO2 1-hour (ppb)	NO2 Annual (ppb)	CO 8-hour (ppm)	CO 1-hour (ppm)	Lead 3-month (ug/m3)
Parklane	0.060	7.2	16	2	--	--	0.972	0.7	--
Congaree Bluff	0.055	--	--	--	--	--	--	--	--
Sandhill	0.062	--	--	--	28	3.61	--	--	--
Maximum design value [2]	0.062	7.2	16	2	28	3.61	0.972	0.7	0
NAAQS Standard [3]	0.070	15	35	75	100	53	9	35	0.15
% of NAAQS Standard	89%	48%	46%	3%	28%	7%	11%	2%	0%
Cearly or Questionably in Attainment? [4]	Questionably	Clearly	Clearly	Clearly	Clearly	Clearly	Clearly	Clearly	Clearly

Notes:

[1] Source: State of South Carolina Annual Ambiant Monitoring Network Plan July 1, 2022- December 31, 2023. *2021 Crieria Design Values (page 30)*

[2] The maximum design value in Richland County for each pollutant was used to determine if the Fort Jackson would be "clearly attainment" or "questionably in attainment" for the NAAQS for each pollutant.

[3] From 40 CFR 50

[4] Ambient air quality below 85% of a NAAQS may be defined as “clearly attainment”. Ambient air quality within 15% of a NAAQS may be defined as “questionable attainment”

Note Values in red did not meet data completeness requirements

APPENDIX C: IPAC REPORT

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Carolina Ecological Services
176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558
Phone: (843) 727-4707 Fax: (843) 727-4218

In Reply Refer To:
Project Code: 2023-0106224
Project Name: Fort Jackson Energy Resilience Project

July 19, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

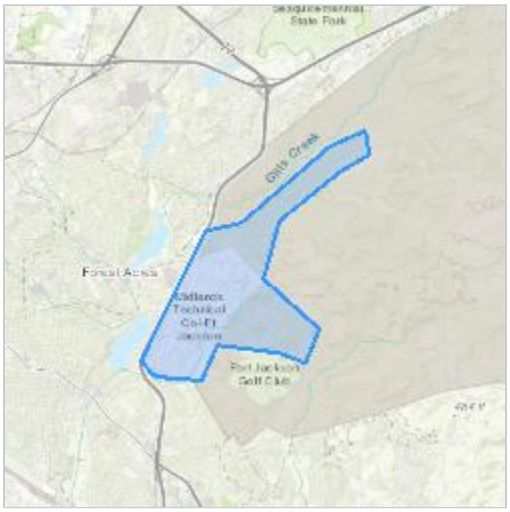
This species list is provided by:

South Carolina Ecological Services
176 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558
(843) 727-4707

PROJECT SUMMARY

Project Code: 2023-0106224
Project Name: Fort Jackson Energy Resilience Project
Project Type: Military Development
Project Description: The proposed action would support Fort Jackson's energy resilience project through development of two natural gas-powered generator units with associated supply piping, a Solar Photovoltaic (PV) System Array, and a microgrid to serve Fort Jackson. The development would serve as a grid-facing asset, providing contingency support to the installation.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@34.0264502,-80.93192734471222,14z



Counties: Richland County, South Carolina

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Red-cockaded Woodpecker *Picoides borealis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Canby's Dropwort *Oxypolis canbyi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7738	Endangered
Rough-leaved Loosestrife *Lysimachia asperulaefolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2747	Endangered
Smooth Coneflower *Echinacea laevigata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3473	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel *Falco sparverius paulus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bachman's Sparrow *Aimophila aestivalis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6177	Breeds May 1 to Sep 30

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Brown-headed Nuthatch *Sitta pusilla* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 1 to Jul 15
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Painted Bunting *Passerina ciris* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Apr 25 to Aug 15
Prairie Warbler *Dendroica discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Swallow-tailed Kite *Elanoides forficatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8938	Breeds Mar 10 to Jun 30
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

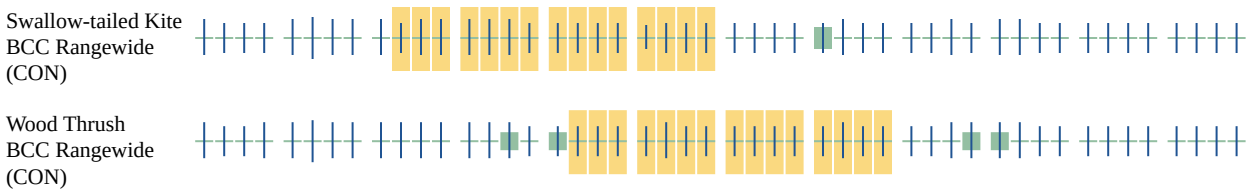
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

- PFO4B
- PFO1Ad
- PFO1/2Fd
- PFO1B
- PFO1/4B
- PSS1A
- PSS1B
- PFO1/4Cd
- PFO1A
- PFO1Bd
- PFO1/4A

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM1Ah
- PEM1Ax
- PEM1Ad

RIVERINE

- R4SBC
- R5UBH

LAKE

- L1UBHh
- L1UBHx

FRESHWATER POND

- PUBHx

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